CIVIL AVIATION MEDICINE

UNIVERSITY OF MICHIGAN
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MAIN READING ROOM

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE UNITED STATES SENATE

EIGHTY-FIFTH CONGRESS

FIRST SESSION

ON

S. 1045

A BILL TO AMEND THE CIVIL AERONAUTICS ACT OF 1938, AS AMENDED, BY ADDING THERETO NEW PROVISIONS RELATING TO AVIATION MEDICINE

APRIL 1, 2, AND 3, 1957

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CIVIL AVIATION MEDICINE

MONDAY, APRIL 1, 1957

UNITED STATES SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D. C.

The subcommittee met, at 10: 08 a. m., in room G–16, United States Capitol, Hon. A. S. Mike Monroney, presiding.

Senator MONRONEY. The Subcommittee on Aviation, of the Committee on Interstate and Foreign Commerce Committee, will be in order.

We have before us hearings on the bill S. 1045, by Senator Magnuson, to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

(S. 1045 is as follows:)

[S. 1045, 85th Cong., 1st sess.]

A BILL To amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Civil Aviation Medical Act of 1957."

SEC. 2. The Civil Aeronautics Act of 1938, as amended, is amended by adding immediately after title XIII thereof the following new title:

"TITLE XIV—CIVIL AVIATION MEDICINE

"PURPOSE

"SEC. 1401. The purpose of this title is to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation, consistently with the declaration of policy in section 2 of this Act.

"DEFINITIONS

"SEC. 1402. As used in this title, unless the context otherwise requires—

"(a) 'Civil aviation medicine' means air medicine as applied to civil aviation, and includes such factors as standards of physical and mental fitness for civil airmen, human requirements in aircraft design and operation, and methods of medical assessment and certification.

"(b) 'Consultant' means medical consultant whose skill, training, and experience qualify him to render advice in his field of specialty.

"(c) 'Council' means the Federal Advisory Council on Civil Aviation Medicine established by section 1409.

"(d) 'Designee' means a physician trained in aviation medicine and specifically designated by the Administrator to assess the physical fitness of civil airmen and applicants for medical certificates.

(NOTE.—The staff members assigned to these hearings are Harold I. Baynton and John W. Black.)

"(e) 'Airman' has the meaning assigned to it by section 1 (6) of this Act, except that the term shall also include any individual who serve as airways

"(f) 'Medical examiner' means any licensed physician who holds the degree of Doctor of Medicine, and who is authorized by the Administrator to perform physical and mental examinations of airmen who are required by Civil Air Regulations of the Civil Aeronautics Board to hold medical certificates.

"(g) 'Medical service' means medical activities in air commerce of the Administrator.

"CREATION AND ORGANIZATION OF OFFICE OF CIVIL AVIATION MEDICINE; DELEGATION OF FUNCTIONS

"SEC. 1403. (a) There is hereby established in the Civil Aeronautics Administration the Office of Civil Aviation Medicine, which shall be composed of (1) the Civil Air Surgeon; (2) Regional Flight Surgeons; and (3) the Civil Aeronautics Medical Research Laboratory.

"(b) There shall be at the head of the Office of Civil Aviation Medicine a Civil Air Surgeon, who shall have the seventeenth grade of the General Schedule in the Classification Act of 1949, as amended, without regard to section 505 (b) of such Act, and shall b in addition to the number of positions authorized to be placed in such grade under such Act.

"(c) There shall be in the Office of Civil Aviation Medicine a Deputy Civil Air Surgeon, who shall have the fifteenth grade of the General Schedule set forth in the Classification Act of 1949, as amended.

"(d) The Civil Air Surgeon shall provide for the exercise of the several functions granted to him by this title through the Office of Civil Aviation Medicine, the Regional Flight Surgeons, and the Civil Aeronautics Medical Research Laboratory, respectively, and shall establish within them such divisions, sections, and other units as he may find necessary for efficient operation of the Office of Civil Aviation Medicine. No division shall be established, abolished, or transferred, and no division shall be consolidated with another, except with the approval of the Administrator.

"(e) The Civil Air Surgeon may delegate to any officer or employee of the Office of Civil Aviation Medicine such of the powers and duties granted to him under this title, except the power to make regulations, as he may deem advisable.

"ADMINISTRATION

"SEC. 1404. Functions granted to the Civil Air Surgeon by this title shall be administered by the Civil Air Surgeon under the immediate supervision and direction of the Administrator.

"REGULATIONS CONCERNING STANDARDS, REQUIREMENTS, EXAMINATIONS, AND MEDICAL CERTIFICATES

"SEC. 1405. The Civil Air Surgeon, in order to carry out the purposes of this title, is authorized to promulgate regulations—

"(1) establishing minimum standards of mental and physical fitness for civil airmen;

"(2) establishing minimum human requirements in aircraft design;

"(3) providing for medical examinations of civil airmen by medical designees or other medical examiners; and

"(4) providing for the issuance of medical certificates to civil airmen and for the amendment, suspension, or revocation of such certificates.

"REGULATIONS CONCERNING INSPECTIONS

"SEC. 1406. The Civil Air Surgeon shall promulgate such regulations as he deems necessary—

"(1) for the inspection of aircraft and aircraft components and appliances designed for use in air transportation in order to meet the human requirements in aircraft design and operation; and

"(2) for the inspection and appraisal of medical examiner facilities and procedures to ensure proper assessment of airman physical fitness and enforcement of regulations and procedures of the Office of Civil Aviation Medicine.

"RESEARCH, INVESTIGATIONS AND TRAINING

"SEC. 1407. (a) The Civil Air Surgeon shall conduct and encourage research and investigation in the field of aviation medicine; and shall cooperate with and render assistance to other appropriate public authorities, scientific institutions, and scientists in the conduct, and in promoting the coordination, of research investigations, experiments, demonstrations, and studies relating—

"(1) to the causes, diagnosis, control, and prevention of physical and mental conditions and impairments of civil airmen that might adversely affect safety in air commerce;

"(2) to the human requirements in aircraft design and conditions of operation; and

"(3) to the medical causes of accidents in air commerce.

"(b) In carrying out the provisions of subsection (a) the Civil Air Surgeon is authorized to—

"(1) collect and make available, through publications and other appropriate means, information as to such research and other activities and the practical applications thereof;

"(2) collect, tabulate, analyze, and interpret pertinent data concerning medical aspects of accidents in air commerce, physical condition of airmen, and such other subjects as may provide guidance in establishing sound medical regulations and directives, and issue periodic statistical summaries and reports embodying the findings obtained;

"(3) establish and maintain research fellowships in aviation medicine in the Office of Civil Aviation Medicine with such stipends and allowances, including traveling and subsistence expenses, as he may deem necessary to procure the assistance of the most brilliant and promising research fellows;

"(4) provide post graduate training courses in civil aviation medicine;

"(5) participate in the investigation of civil aircraft accidents, and where indicated require physical examination or autopsy of passengers and crew involved; and

"(6) adopt, upon recommendations of the Council, such additional means as he deems necessary or appropriate to carry out the purposes of this section.

"CONTROL GRANTS

"SEC. 1408. The Civil Air Surgeon is empowered to make grants-in-aid to universities, hospitals, laboratories, and other public or private institutions and to individuals for such research projects as are recommended by the Council, with respect to civil aviation medicine.

"AVIATION MEDICINE EDUCATION AND INFORMATION

"SEC. 1409. From time to time the Civil Air Surgeon shall publish information, related to civil aviation medicine, in the form of publications or otherwise, for use of the public, the aviation industry, and persons and institutions engaged in work related to functions of the Office of Civil Aviation Medicine.

"GENERAL AUTHORITY TO PRESCRIBE REGULATIONS

"SEC. 1410. (a) The Cvil Air Surgeon, with the approval of the Administrator, unless specifically otherwise provided, shall promulgate all regulations necessary for the administration of the Office of Civil Aviation Medicine.

"(b) Nothing contained in this section shall affect the authority of the Surgeon General, Public Health Service, to provide by regulations for the application to air navigation and aircraft of any of the provisions of sections 364, 365, and 366 of the Public Health Service Act.

"LIMITATION ON AUTHORITY OF THE BOARD BY SECTION 601

"SEC. 1411. Nothing in section 601 of this Act shall be held to authorize the Civil Aeronautics Board to prescribe any standards, rules, or regulations with respect to any matters included within the scope of the powers and functions granted to the Civil Air Surgeon by this title.

"USE OF AVIATION MEDICAL SERVICE IN EMERGENCY

"SEC. 1412. In time of war or of emergency proclaimed by the President, the Office of Civil Aviation Medicine may be utilized in the performance of any

related activities to such an extent and in such manner as will, in the judgment of the President, promote the public interest.

"FEDERAL ADVISORY COUNCIL ON CIVIL AVIATION MEDICINE

"SEC. 1413. (a) There shall be a Federal Advisory Council on Civil Aviation Medicine consisting of seventeen members. The Director of the Civil Aeronautics Medical Research Laboratory and the Secretary of the Air Force, the Secretary of the Navy, the Secretary of Health, Education, and Welfare, and the Secretary of Agriculture, or their designees, shall be ex-officio members. The Civil Air Surgeon, with the approval of the Administrator, shall appoint, without regard to civil service laws, twelve members of the Council who shall be persons not otherwise in the employ of the United States, skilled in sciences related to aviation medicine. Each appointed member shall hold office for a term of four years, except that, of the members first appointed, three shall appointed for a term of three years, three shall be appointed for a term of two years, and three shall be appointed for a term of one year, as designated by the Civil Air Surgeon at the time of appointment. None of such twelve members shall be eligible for reappointment until a year has elapsed since the end of his preceding term.

"(b) The Council shall advise, consult with, and make recommendations to the Civil Air Surgeon on matters relating to the aviation medical activities and functions of the Office. The Civil Air Surgeon is authorized to utilize the services of any member or members of the Council in matters related to the work of the Office of Civil Aviation Medicine for such periods, in addition to conference periods, as he may determine.

"EMPLOYMENT OF SPECIAL CONSULTANTS

"SEC. 1414. Special consultants may be employed by the Civil Air Surgeon to assist and advise in the operations of the Office of Civil Aviation Medicine. Such consultants may be appointed without regard to the civil service laws and their compensation may be fixed without regard to the Classification Act of 1949, as amended.

"COMPENSATION OF MEMBERS OF COUNCIL AND SPECIAL CONSULTANTS

"SEC. 1415. Members of the Federal Advisory Council on Civil Aviation Medicine, other than ex-officio members and specialist consultants, while attending conferences, hearings, or meetings, or while otherwise serving at the request of the Civil Air Surgeon, shall be entitled to receive compensation at the rate to be fixed by the Administrator, but not exceeding $50 per diem, and shall also be entitled to receive an allowance for actual and necessary traveling and subsistence expenses while serving away from their place of residence.

"RESEARCH FACILITY

"SEC. 1416. There is hereby authorized to be appropriated a sum not to exceed $2,500,000 for the erection and equipment of suitable and adequate buildings and facilities for use of the Civil Aeronautics Medical Research Laboratory in carrying out the provisions of this title. The General Services Administration is authorized to acquire by purchase, condemnation, donation, or otherwise, a suitable and adequate site or sites, selected on the advice of the Civil Air Surgeon, in the District of Columbia, or elsewhere in the continental United States, for such buildings and facilities, and to erect thereon, and furnish and equip, such buildings and facilities. The amount authorized by this section to be appropriated shall include the cost of the preparation of drawings and specifications, supervision of construction, and other administrative expenses incident to the work: *Provided*, That the General Services Administration shall prepare the plans and specifications, make all necessary contracts, and supervise construction.

"DETAIL OF EMPLOYEES

"SEC. 1417. (a) The Administrator is authorized, upon the request of the head of an executive department, to detail employees of the Office of Civil Aviation Medicine to such department for duty as agreed upon by the Administrator and the head of such department, in order to cooperate or conduct work related to such department or to the Office of Civil Aviation Medicine. When

such employees of the Office of Civil Aviation Medicine are so detailed, their salaries and allowances may be paid from working funds established as provided by law or may be paid by the Administrator from applicable appropriations, and reimbursement may be made as agreed upon by the Administrator and the head of the executive department concerned.

"(b) Upon the request of any State aviation authority, employees of the Office of Civil Aviation Medicine may be detailed by the Civil Air Surgeon for the purpose of assisting such State or a political subdivision thereof in work related to the functions of the Office of Civil Aviation Medicine.

"(c) The Civil Air Surgeon may detail employees of the Office of Civil Aviation Medicine to nonprofit educational research or other institutions engaged in aviation medicine activities for special studies of scientific problems and for the dissemination of information relating to civil aviation medicine.

"(d) Employees detailed under subsection (b) or (c) shall be paid from applicable appropriations of the Office of Civil Aviation Medicine, except that in accordance with regulations such personnel may be placed on leave without pay and paid by the State, political subdivision, or institution to which they are detailed. The services of personnel while detailed pursuant to this section shall be considered as having been performed in the Office of Civil Aviation Medicine for the purposes of longevity pay, promotion, retirement, and compensation for injury or death.

"INTERDEPARTMENTAL WORK

"SEC. 1418. Nothing contained in this title shall affect the authority of the Administrator to furnish any materials, supplies or equipment, or perform any work or services requested in accordance with section 7 of the Act of May 21, 1920, as amended (U. S. C., title 31, sec. 686), or the authority of any other executive department to furnish any materials, supplies or equipment, or perform any work or services, requested by the Administrator for the Office of Civil Aviation Medicine in accordance with that section.

"GIFTS

"SEC. 1419. (a) The Administrator is authorized to accept, on behalf of the United States, gifts made unconditionally by will or otherwise for the benefit of civil aviation medicine or for carrying out any of its functions. Conditional gifts may be so accepted, if recommended by the Civil Air Surgeon, and the principal of the income from any such gift shall be held, invested, reinvested, and used in accordance with its conditions, but no gift is to be accepted which is conditioned upon any expenditure not to be met therefrom, or from income thereof, unless such expenditure has been approved by Act of Congress.

"(b) Any unconditional gift of money accepted pursuant to the authority granted in subsection (a) of this section, the net proceeds from the liquidation (pursuant to subsection (c) or subsection (d) of this section) of any other property so accepted, and the proceeds of insurance on any such gift property not used for its restoration, shall be deposited in the Treasury of the United States and are hereby appropriated and shall be held in trust by the Secretary of the Treasury for the benefit of the Office of Civil Aviation Medicine, and he may invest and reinvest such funds in interest-bearing obligations of the United States or in obligations guaranteed as to both principal and interest by the United States. Such gifts and the income from such investments shall be available for expenditure in the operation of the Office of Civil Aviation Medicine and the performance of its functions, subject to the same examination and audit as is provided for appropriations made for the Civil Aeronautics Administration by Congress.

"(c) The evidences of any unconditional gift of intangible personal property, other than money, accepted to pursuant to the authority granted in subsection (a) of this section shall be deposited with the Secretary of the Treasury and he, in his discretion, may hold them, or liquidate them except that they shall be liquidated upon the request of the Administrator, whenever necessary to meet payments required in the operation of the Office of Civil Aviation Medicine or the performance of its functions. The proceeds and income from any such property held by the Secretary of the Treasury shall be available for expenditure as is provided in subsection (b) of this section.

"(d) The Administrator shall hold any real property or any tangible personal property accepted unconditionally pursuant to the authority granted in subsection (a) of this section and he shall permit such property to be used for the

operation of the Office of Civil Aviation Medicine and the performance of its functions, or he may lease or hire such property, and may insure such property, and deposit the income thereof with the Secretary of the Treasury to be available for expenditure as provided in subsection (b) of this section: *Provided*, That the income from any such real property or tangible personal property shall be available for expenditure in the discretion of the Administator, for the maintenance, preservation, or repair and insurance of such property and that any proceeds from insurance may be used to restore the property insured. Any such property when not required for the operation of the office of Civil Aviation Medicine or the performance of its functions may be liquidated by the Administrator, and the proceeds thereof deposited with the Secretary of the Treasury, whenever in its judgment the purposes of the gift will be served thereby.

"(e) Donations of $50,000 or over in aid of research may be acknowledged by the establishment within the Civil Aeronautics Medical Research Laboratory of suitable memorials to donors.

"AVAILABILITY OF APPROPRIATIONS

"SEC. 1420. Appropriations to carry out the purposes of this title shall be available for the acquisition of land or the erection of buildings only if so specified, but, in the absence of express limitations therein, may be expended in the District of Columbia for personal services, stenographic recording and translating services, by contract if deemed necessary, without regard to section 3709 of the Revised Statutes; traveling expenses (including the attendance at meetings when specifically authorized by the Civil Air Surgeon); rental, supplies, and equipment, purchase and exchange of medical books, books of reference, directories, periodicals, newspapers, and press clippings; purchase, operation, and maintenance of motor propelled passenger carrying vehicles; printing and binding (in addition to that otherwise provided by law); and for all other expenses in carrying out the provisions of this title.

"MISCELLANEOUS

"SEC. 1421. (a) Notwithstanding the provisions of this title, existing rules, regulations of or applicable to the medical service, and executive orders relating thereto, shall remain in effect until repealed, or until modified or superseded by regulations made in accordance with the provisions of this title.

"(b) All appropriations, allocations, and other funds, and all properties, available for use by the present Medical Division of the Civil Aeronautics Administration or unit thereof shall continue to be available to the Office of Civil Aviation Medicine.

"(c) The provisions of this title shall not affect the term or tenure of office or employment of any officer or employee in office or employed by the Administrator at the time of its enactment.

"(d) Notwithstanding the provisions of this title, existing positions, branches, committees, and procedures in the Medical Division shall continue until repealed, or until modified or superseded by regulations made in accordance with the provisions of this title."

Senator MONRONEY. This is a very important bill dealing with means of keeping abreast of the many things necessary in the way of medical examination and health requirements in the jet air age which is almost upon us.

We have a distinguished group of witnesses to tell us about the bill. In order to expedite the hearing I believe we would first like to hear from Dr. William F. Ashe, chairman of the department of preventive medicine, Ohio State University.

We would appreciate the benefit of your comments. We have your statement if you would care to read that and then testify as to any questions or anything that you would like to add.

STATEMENT OF DR. WILLIAM F. ASHE, M. D., CHAIRMAN, DEPARTMENT OF PREVENTIVE MEDICINE, OHIO STATE UNIVERSITY

Dr. ASHE. Thank you, sir.

Gentlemen of the committee, I should like to address my comments considering Senate bill 1945 to 3 main areas: The existing state of ill health of civil aviation medicine; the need for civilian aviation medicine research; and the need for graduate and postgraduate education in civil aviation medicine.

As I think many of you know, after World War I, a small analytical table appeared which showed that of every 100 air casualties, 2 of them were shot down, 8 came down because of mechanical failures, and 90 came down because of human failure.

This table provided beyond any reasonable doubt that if man is to fly successfully, his physciological and psychological limitations above the earth's surface must be fully understood and become the primary consideration in the design of flying machines. Thus aviation medicine was born in this country for the military.

Throughout the years such very great men as General Armstrong, General Benson, Captain Grabiel, who is in our audience, Dr. MacFarland, Dr. Hitchcock, and hundreds of others, through their human research efforts, have made safe, effective flying even at supersonic speeds possible. It is not possible to do that without good medical research and good medical supervision.

It is no more possible to fly effectively and safely without medical knowledge and supervision than it is to handle radioactive materials without it. The hundreds of millions of dollars that have been spent in military aviation medical research and education have been very well advised.

There has been an assumption, however, that these military studies provide all of the necessary answers for civilian air transportation. This assumption is false.

Last year, about 41 million passengers flew something over 20 billion miles over the United States, but unlike the military flyer they were not all healthy, young adult males. Some of them were unborn babies, some of them were pregnant mothers, many had heart disease, some had cancer, and undoubtedly there were people flying who have epilepsy or glaucoma and so forth.

We do not know that the planes in which we fly these people are entirely safe for them. We don't know that the mechanism of operation is entirely safe, or that the cabin altitudes which we maintain are ideal for that situation. And it causes me some alarm because while at high altitudes now we maintain a cabin pressure of 5,000 feet, with the jets they are considering 6,700 to 8,500 feet, and it is certain that people who have serious heart disease or serious arteriosclerosis of the brain can get into trouble at those altitudes.

These planes are often flown by pilots 50 years of age and older who have more flying hours than almost anyone in the military has ever achieved. These senior pilots are flying by right of a medical certificate which is based upon standards developed years ago, for youngsters, which have never been validated in the light of present medical knowledge for men their age.

They are certified by CAA medical examiners whose qualifications cannot be checked adequately because there is not an adequate supply of trained supervisors. There is no training program for them in modern methods and new developments in medicine, and many of the airlines have no medical department of their own.

Military aviation medical research and education programs have never studied these particular problems and there is no reason why they should.

To me the shocking fact is that the Civil Aeronautics Administration hasn't studied them, either. In fact, nobody has.

In terms of the real magnitude of the job, there is really very little civil aviation medical program. Untrained laymen are making medical decisions in the Civil Aeronautics Board, and they are making them without benefit of expert medical advice.

District Civil Aeronautics Administration medical supervisors are so understaffed that a good many people at certain seasons of the year, even several thousand flyers, are flying planes when their medical certificates have not yet been checked to determine whether or not they are able to fly. This again is a lack of adequate medical supervisory control.

Senator MONRONEY. How often do those have to be checked? Once a year?

Dr. ASHE. It depends on the class of pilots.

Senator MONRONEY. Commercial.

Dr. ASHE. Twice a year commercial transport, once a year noncommercial transport, and once every 2 years for various kinds of private flyers.

The details of that I think Dr. Stovall can give you, sir.

Everybody knows that the air traffic problem has become more serious and dense, and we are still controlling them by human operators in control towers.

The men running these things—and if you have never been in one I urge you to go someday and see how they operate—have an increasingly complex job and we simply do not know how much these operators can stand without beginning to make mistakes.

With the coming of the jet age, when everything is going twice as fast, it is questionable indeed whether they can do this, and there is no measure of what they can handle without getting into trouble.

Many pilots are also flying a wide variety of planes with nonstandardized equipment so that it is possible for them to reach for the wrong lever or handle and make mistakes, because they have flown one from 8 to 10 in the morning and another one again in the same day.

The wonder to me is how they get away with it. In the coming jet age, only 2 years away, everything speeded up, it is quite possible that we will not. It seems to me that the purpose of Senate bill 1045 is to correct this very dangerous situation as rapidly as possible, and I certainly wish to commend to you gentlemen the general purpose of this bill.

Now a few words about specific parts of it.

There is today a request for a civil aeronautics medical research laboratory. It seems to me that there is a need for something which I choose to call a Civil Aviation Medical Institute, whose purpose is to study the noncompetitive human factor aspects of civilian aviation.

These include validatable up-to-date standards of physical fitness and general health for all classes of pilots; a careful study of the human factors appicable to civil air transport design for all ages, of both pilots and passengers; and the human factors of an errorless traffic control system. It also needs a meticulous medical study of all traffic accidents and near accidents.

Such an institute should be established by a research team representing all of the scientific disciplines concerned with human factors research. It should be placed in an area of easy access to clinical material and academic consultation in the areas of engineering, mathematics, physics, pathology, agriculture, meteorology, physiology, and psychology.

In short, it would seem to me that it ought to be something like the aeromedical laboratory at Wright-Patterson Air Base or Pensacola but to deal only with civil aviation medical problems. I think it probably should be administered by a Government agency for technical and financial reasons. However, I suggest that its scientific staff ought probably also to have attachments to a university. This suggestion is made because, as I go around to various governmental research laboratories, they have increasing difficulty getting and retaining competent scientific personnel outside the university atmosphere.

The second area of the bill suggests that there is need for education and training of the medical supervisory personnel in CAA. This, as far as I am concerned, is a must. There needs to be an adequate selection of the doctors who are going to do CAA medical examinations. They need to be educated as to what the rules of the game are, why they are, and they need to be brought up to date and kept up to date so far as the medical requirements of various kinds of flying are concerned.

As you know, at least for private pilots, there are a great many CAA medical examiners whose qualifications CAA does not know at all and in no way control. And they have no way, other than the application form, of really knowing whether the man who is doing the job is competent to do it and is doing it well.

There seems to me to be also a need for graduate and postgraduate education for physicians who may one day become the medical directors of airlines or of airplane manufacturing companies or members of human research teams. There is very little interest in civil aviation medicine among our physicians generally, and there certainly is some need for enlightenment in that area.

I have a strong feeling that the universities are willing to do a good portion of this educational job. I do know that they need some training grants and support to get it started because they have not been able to do it on their own at the present time.

There are a great many other provisions of the bill that deal with a civil air surgeon and how much he should be paid, this, that, and the other. As far as I am concerned, this seems to me to be in the area of the technique of government, and I therefore would leave the mechanism of achievement of adequate medical supervision in civil aviation to you people who know very much more about it than I do or ever will.

That supervision is not adequate at the present time and needs to be. I suggest that not only do you try to solve the problem, but try to find out also why it has not been adequate up until now.

Thank you, sir.

Senator MONRONEY. Thank you very much, Dr. Ashe, for your statement.

We appreciate the work that you have done on the need for developing a better understanding of the problems facing us on the civil aviation basis.

I wonder, would you visualize it to be an impossibility to try to combine the aviation research sections of Wright-Patterson Air Base with the Navy and with the CAA? Are the problems so incompatible one to the other that it would make it impossible to utilize the same plan or the same institution for the whole study?

Dr. ASHE. Sir, I don't think it is a matter of incompatibility of problem. I think it is a matter of people to get at, and the importance of the job that the military has to try to do in its own area. They are working, as you know now, at tremendous altitudes and tremendous speeds. Actually stratospheric problems. And it uses up all their time. They have not been able to deal with the pregnant woman or the old gentleman who has arteriosclerosis, and they have no clinical facility for getting at them if they do. They don't have any experience and large groups of pilots to work with who are approaching the upper limit of their flying time. I don't think it is an incompatibility of purpose as much as practicality. I am not sure that they could do it.

Senator MONRONEY. In other words, you would take all the gains they make in their independent research on your extremely high altitude flying and speeds, deceleration and things of that kind, and still make that available to a civil research foundation?

Dr. ASHE. Certainly. Certainly all that has gone into learning human factors in the designing of planes has been tremendously useful to the civilian flying group. There is no question about it. But there are areas in which the military have not been able to do the job and there is no reason why they should. It is entirely outside their normal category. They haven't got people, patients, and what not to deal with.

Senator MONRONEY. Senator Payne?

Senator PAYNE. You asked a question that I had in mind with reference to seeing whether or not it could be absorbed under the other.

Dr. ASHE. It seems to me that the rate at which American passengers are flying is tremendous. I think the figure last year was quoted recently in the papers as about 41 million. The year before, some 29 million. And the year before that, 18. And it is going right up. It therefore becomes a sizable public-health question because anyone who can walk up to a desk who looks reasonably good can buy a ticket. But we do want to know, and I think since it is an interstate commerce affair, whether what we are doing with this civilian population is in fact safe.

Senator PAYNE. And there would have to be substantial additional moneys made available even if you were to use the present facilities of the military.

Dr. ASHE. Iwould believe that to be so, sir.

I know nothing really about their budget except that comparably I suppose it must be something of the order of the magnitude of a

quarter million flyers, and I don't know what their medical budget is but it runs into millions.

CAA has a medical budget of $310,000 this year to look after the safety of 10,000 commercial pilots and 200,000 general pilots and 41 million people flying. They can't do it; I am sure of that.

Senator MONRONEY. You have done some work in your specialty on aviation safety?

Dr. ASHE. Yes, sir.

Senator MONRONEY. Could you detail some of that?

Dr. ASHE. My introduction to this area was first at the Kettering Laboratory at the University of Cincinnati which has to do with occupational medicine prior to World War II. It concerns itself with industrial toxicologic research, primarily.

In World War II, I was first sent to Fort Knox where I helped to design and staff the armored force medical laboratory, which deals entirely with tank problems, whether a man can or can't go safely in tanks. We ran into some very interesting, curious anomalies of design.

I will cite just one. They had a periscope, as you know, to look out through the turret to see where the gun was to be fired. The distance between the entrance pupil of that periscope and the top of the roof was 5½ inches, but from the top of a man's head to his eyes with a helmet was 7½. That kind of error, not relating it to the man who uses it, is the basic principle, whether it be in the air, tank, submarine, or what not.

After the war I started the first school of industrial medicine with Dr. Kehoe at Cincinnati, who recently moved to Ohio State University to develop that area. The Ohio State University, at the present time, has the only 3-year board-approved graduate training program in aviation medicine. And we have with us Dr. Hitchcock in physiology; Dr. King, part time, physiology; Dr. Carter, who is an M. D. physiologist from Randolph Field; myself; Dr. Fitz in psychology; and a number more.

There are a number of people on the campus who have worked with Wright Field and with Lockbourne for a considerable time in this area and that is our reason for having familiarity with it.

Senator MONRONEY. Do you have any questions?

Mr. BAYNTON. Just one question for the record, Dr. Ashe.

In your experience in industrial medicine or occupational medicine, have you found that when there is a proper medical program connected with the safety operation of a plant, let's say, that your accident rate does go down?

Dr. ASHE. Yes, sir; I think that can be documented for you very thoroughly by the National Safety Council statistics. But let me cite you an example.

The DuPont Co. began its medical program in, I think, 1913. At that time they had several thousand thoroughly disabling injuries and several deaths per year, with 3,000 employees. They have developed an extensive medical program and now have over 90,000 employees with no disabling injuries and no deaths in the last couple of years.

A small die company, doing the same kind of work with no medical program, has injured eyes, burned arms, chemical burns of this sort all the time. And this supervision does cut accident rates materially.

Senator MONRONEY. Doctor, how many medical specialists would you estimate there are in the field of aviation medicine in the United States?

Dr. ASHE. Sir, I am incompetent to answer your question. There are men in the audience who can. I think General Byrnes can, and I think probably Dr. Graybiel can.

Senator MONRONEY. It is a relatively new specialty; is it not?

Dr. ASHE. Yes, the specialty is, I think, 2 or 3 years old, in that it developed board certification, approval by the American Medical Association, by the American Board of Preventive Medicine, by the Association of Medical Colleges at that time.

The membership of the Aero-Medical Association probably is around 3,000, though I don't know the exact number, and those are people who developed a genuine interest in this area during and after the war, but not all of them by any means, are certified.

Senator MONRONEY. All of them are expert or specialized in the field?

Dr. ASHE. Some are expert who are not certified, I am sure. That is the usual case.

Senator MONRONEY. It is more or less an interest rather than an effective postgraduate study?

Dr. ASHE. Yes, sir.

Senator MONRONEY. There are no real postgraduate courses in existence today?

Dr. ASHE. It just began last year.

Senator MONRONEY. At Ohio State?

Dr. ASHE. And at Harvard.

Senator MONRONEY. What type courses are they?

Dr. ASHE. The one that is given at Harvard by Dr. McFarland is a 1-year course for a degree of master of public health, in which all of the emphasis is placed upon aviation medicine problems.

They also have a master of public health that deals with industrial medicine or communicable disease. This one is primarily in the interest of aviation medicine and is taught primarily by Dr. Ross McFarland, who has written the two best books on the subject ever produced.

The one at Ohio State is a 3-year training program, which fits in with the specialty board requirements. Two are spent at the university in basic science training, flight physiology, flight toxicology, flight psychology, radiation hazards, workmen's compensation law, communicable disease controls, statistics, epidemiology, and so forth, that are a part of the requirements of that board. Then the third year is spent in preceptorship under someone who has a civil aviation problem, who is certified by the board. That might be in an airframe outfit like Boeing at Seattle, where Dr. Hanks has 59,000 employees and deals with all the problems of aviation from the beginning of design on through to actual test flying. It could conceivably be with a medical director of an airline or it could be with someone in CAB. Any 1 of those 3 preceptorial third years would be acceptable, at the present time. But that began only last July. The first man is therefore one-third of his way through at the present time.

Senator MONRONEY. So far as you know, those men are at universities?

Dr. ASHE. Yes. I have not been able to track down others, and I have been hunting because we want to report this matter to the Aero-Medical Association next Monday.

I think those are the only two. There is a little bit of a program at Johns Hopkins which the Navy uses as a part of the whole, and I do not know its present status. I think Captain Graybiel can tell you.

Senator MONRONEY. These are independent from the Navy and the Air Force research?

Dr. ASHE. Yes; they are.

Senator MONRONEY. And they probably would feed some men into that?

Dr. ASHE. They do.

Senator MONRONEY. And some of their experts into college, I imagine, from there?

Dr. ASHE. As I understand the board requirement for the military, they spent 2 in the military and 1 in the civilian institution, getting a master of public health degree in this area. There are other men in the audience who can clarify that for you.

Senator MONRONEY. Doctor, we thank you very much for your appearance here and for giving the committee the benefit of your studies.

You mentioned several other men who were in the audience. Would you supply their names to us, who are experts in this medical field? I didn't see the names on your list.

Dr. ASHE. The man who can answer the questions about education in the Navy is Capt. Ashton Graybiel, who is here; and the man who can answer them for the Air Force is General Byrnes.

Senator MONRONEY. I thought you mentioned some of your associates at Ohio State University?

Dr. ASHE. Dr. Barry King is in the audience. He is a member of the CAA, scientific group. He is responsible for the activities of the little barracks-contained laboratory that the CAA has on the campus of Ohio State, and he has an appointment on the Ohio State faculty. The CAA has a small laboratory on the Ohio State campus which is housed in an old military barracks.

Senator MONRONEY. I believe you mentioned some other professors.

Dr. ASHE. None of the others that I mentioned are here, sir.

Senator MONRONEY. Thank you very much for appearing, Doctor, and helping us out on this piece of legislation.

Dr. ASHE. I appreciate the privilege of doing so.

Senator MONRONEY. We would like to take out of order, because of some very important matters coming before him, the Administrator of the Civil Aeronautics Administration, Mr. James T. Pyle.

Mr. Pyle, we are very happy to have you here and appreciate your coming forward to give us your testimony. Following the completion of your testimony, we will excuse you so that you can go back to some of the problems that you have at your desk downtown.

STATEMENT OF JAMES T. PYLE, ADMINISTRATOR OF CIVIL AERONAUTICS

Mr. PYLE. Mr. Chairman and Senator Payne, I appreciate the opportunity of coming up and appearing before you, and I appreciate

your courtesy in letting me come here out of order. There are a few brush fires that we have to get down to take care of.

I am James T. Pyle, Administrator of Civil Aeronautics. I would like to comment briefly on Senate bill 1045, which we commonly refer to as the aviation medical bill.

Let us first consider the purpose of the bill. The preamble states that its purpose is "to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation * * *." The Department of Commerce is fully in accord with this objective. However, our approval is not without reservations. While we are in accord with the objectives, we believe there are some matters that need to be looked into. Here are a few questions that illustrate what we mean. Could the expenditure called for be more productively spent in other ways? Is the bill timely in view of aeromedical research projects now under way? Is too much power given to the Civil Air Surgeon?

Before enlarging on these questions, I would like to review briefly the basic provisions of the bill and to point out how and to what extent they change the medical functions in operation under our present CAA medical setup.

The bill would establish the "Office of Civil Aviation Medicine" composed of:

The Civil Air Surgeon, as head of the office, regional flight surgeons, and the Civil Aeronautics Medical Research Laboratory.

We already have within the Civil Aeronautics Administration a Medical Division, composed of a chief of the division, and his staff, including regional medical officers. The Medical Division is presently 1 of the 4 divisions of the Office of Flight Operations and Airworthiness.

The present bill would elevate the Medical Division from "division" status to "office" status. It would concurrently create the Civil Aeronautics Medical Research Laboratory and authorize to be appropriated a sum not to exceed $2,500,000 for the erection and equipment of adequate buildings for the use of this laboratory.

The building and equipping of this laboratory, and such staff additions as may prove necessary to operate it, represent the principal change—substantively—in the present Medical Division establishment.

The bill also creates a Federal Advisory Council of Civil Aviation Medicine consisting of 17 members. These members are to serve without compensation, except on a fixed per diem basis. The creation of such an advisory council would, we believe, be a highly desirable instrumentality for the development of aeromedical research. Such a council would undoubtedly be extremely useful in resolving many aeromedical questions. It could be of great help in the formulation of sound standards for civil airmen as we move into speeds above the speed of sound and begin to explore the stratosphere. However, I believe we should have in mind that there exists ample authority under present law to create and utilize the expert services of such an advisory board. I might add, that steps are being taken to develop and activate this very idea. I want to say more about this later.

We recognize that present-day mental and physical standards are inadequate to meet tomorrow's jet-age problems. We need more

complete and precise knowledge of the human factors affected—both mental and physical. Obviously it would be illogical as well as impractical to develop jet-age aircraft without at the same time finding out if pilots and passengers could survive flying in them. We already have accumulated much useful knowledge on these subjects.

But there is still much we do not know about the effect of altitudes, pressures, accelerations, vibrations, compressions, and other strains and stresses on pilots and passengers. What this bill seeks to accomplish in this field of research is of fundamental importance. Therefore, as I have stated, the only question that concerns us about this bill is whether it is timely; whether it presents the best means for solving these problems; whether equally good or perhaps even better results could be more economically achieved; and, finally, whether it reposes too much power in the Civil Air Surgeon.

Before action is taken with respect to the need for new legislation we believe that further studies should be made to determine if the $2,500,000 expenditures that would be authorized to build and equip a Government-operated aeromedical laboratory plus the added money needed to operate it might not be much more fruitfully spent in continuing and expanding, if necessary, already existing research efforts and facilities.

We are not overlooking the possibility that expenditures in both of these directions may later prove to be necessary. However, there are at the present time no less than 58 aeromedical research projects being conducted by military and civilian organizations throughout the country. Some of these are at no expense to the Government. Some are conducted solely by the Military Establishment. Some are carried on by private institutions with funds contributed in whole or in part by the Federal Government. As an example of the latter, I want to mention the important work being carried on by the Flight Safety Foundation of New York. Here a special study is being made of the fields in which aeromedical research is needed, and of physical standards that should be established for airmen. The Civil Aeronautics Administration has contributed $100,000 to this project.

Senator MONRONEY. Is that a medical research project, Mr. Pyle?

Mr. PYLE. As I understand it, it is, sir. However, Dr. King I think should comment specifically on your question. Would you like it at this point, sir?

Senator MONRONEY. No. We will ask him to testify later. He could tell us whether it is strictly a medical operation or whether it is connected with a lot of other things. It is the Flight Safety Foundation. It could include mechanical and other things.

Dr. KING. The objective of the study is to study physical standards and medical problems through a job analysis approach of what the airman duties are. This does not constitute a research project, however, but rather a study and assembly of information which is available.

Senator MONRONEY. But all dealing with the medical problems?

Dr. KING. All dealing with medical problems.

Senator MONRONEY. Nothing as to mechanical?

Dr. KING. Only insofar as the human engineering enters into it.

Senator MONRONEY. Fatigue and things of that kind would enter into it?

Dr. KING. Yes, sir.

Senator MONRONEY. Thank you, Doctor.

Mr. PYLE. One of the projects we are looking at is the very problem which Dr. Ashe correctly mentioned as one of real concern, the matter of the traffic controller and his exposure to fatigue.

Senator MONRONEY. I don't see how those boys keep from losing their minds.

Mr. PYLE. It is a serious problem.

Senator MONRONEY. With the amount of traffic that is coming into Washington now, and LaGuardia or other airports, they are the ones who have to be the best and the most experienced that you can have in those towers. They find it almost impossible to have adequate relief at regular hours because of the congestion and danger sometimes if they would absent themselves from the tower.

Mr. PYLE. That is absolutely correct.

Senator MONRONEY. You have grave difficulty in getting adequate replacements for them to spell them during periods that they should be relieved for rest or recuperation.

Mr. PYLE. That is very correct, sir; and we are doing our utmost to get this relief for them in terms of manpower and training. This is a very real problem because it involves money, recruitment, and all the attendant problems connected therewith.

Senator MONRONEY. Do you think whatever medical problems exist in relationship to pilots, and passengers that are airborne, that certainly the man at the control tower also presents a problem and a need for special medical study?

Mr. PYLE. Very definitely.

Senator MONRONEY. You may proceed.

Mr. PYLE. While these studies are being carried on by the Flight Safety Foundation, CAA is conducting a research project at Ohio State University. This is a continuous project conducted by our own technical staff consisting of eight persons. Our research facilities are also used by the university to provide special instruction to graduate medical students in the field of civil aviation medicine. The research data developed here provide a factual basis upon which official regulatory action may be taken in the interest of safety. Let me just enumerate, by way of illustration, some of the subjects covered at the university. Here are five of them: Effects of sudden decompression on passengers; emergency oxygen administration procedures; emergency evacuation studies; human factors of visibility as related to collision avoidance; pilot fatigue.

The military services are also extensively engaged in aeromedical research projects. Many of these are related to tactical flight. Nevertheless, it is quite evident to us that the knowledge and information already acquired and that will be acquired in these military research projects will, to a very considerable extent, be equally applicable to civilian flight problems.

What I have related are examples of progressive efforts already in action in the field of aviation medicine. Of course, much work remains to be done. Although we need expanded facilities and more medical and technical experts to carry on and hasten this work, we do not see where a new law is necessary to accomplish this. There is already adequate legal authority to carry on this work. This authority is found in the Civil Aeronautics Act of 1938, as amended.

It is essentially because of these considerations that we question the need for the enactment of Senate bill 1045. At least, we seriously question the need for its enactment at this time—a time when numerous military and civilian agencies are already hard at work on these problems; when the need for economy in government is the byword of the day; and when we are as yet not at all certain that the expenditure called for by this bill could not be more productively channeled into research centers such as Ohio State University or other great medical centers.

In giving consideration to these things we are not saying that economy is more important than safety. We are simply indicating our feeling that the dollars involved might be more advantageously spent if, instead of investing them in the proposed aeromedical laboratory and its staffing costs, the money might not be better put to work utilizing and, where necessary, expanding our already existing research facilities.

In line with this thinking, we initiated meetings with the American Medical Association early this year for the purpose of obtaining its advice on how the aeromedical situation might be improved. A joint meeting of a specially selected group of eminent physicians in this field was held, many of whom are here today actually. During this meeting aviation medical problems in general were explored. The value of various existing aeromedical projects were taken into account. The American Medical Association is now studying what recommendations should be made leading to an increase in medical assistance in dealing with these problems.

These recommendations will deal generally with the need for a current and comprehensive medical and physiological study of flight physical standards. They will also cover the need for additional medical assistance in the field of guidance for research and planning programs; for physical standards for the future; and as to means for providing expert advice on controversial aeromedical problems. An official report on these matters is expected from the American Medical Association in the near future. We feel certain this report will be a valuable guide to us in charting our future course of action.

I would now like to speak about another part of this bill, a part which contains provisions quite separate from its provisions dealing with aeromedical research. The part I am about to mention seems open to some serious basic objections. You will recall that the bill names a civil air surgeon. Section 1405 would invest this civil air surgeon with almost complete and arbitrary authority over the formulation, promulgation, administration, and enforcement of the civil air regulations pertaining to physical standards. To make this clear, I think it will be helpful to refer to the specific language of the bill, which would delegate to the civil air surgeon, and I quote the authority:

(1) To establish minimum standards of mental and physical fitness for civil airmen;

(2) To establish minimum human requirements in aircraft design;

(3) To provide for medical examinations of civil airmen by medical designees or other medical examiners; and

(4) To provide for the issuance of medical certificates to civil airmen and for the amendment, suspension, or revocation of such certificates.

And in a similar provision, section 1406 provides that, again quoting:

> The civil air surgeon shall promulgate such regulations as he deems necessary—
> (1) For the inspection of aircraft and aircraft components and appliances designed for use in air transportation in order to meet the human requirements in aircraft design and operation.

While this bill does not specifically so provide, it seems to us that its enactment would divest the Civil Aeronautics Board of its present rulemaking authority in this area, and transfer this entire function to the civil air surgeon.

Considering that the Board under the provisions of the Civil Aeronautics Act of 1938, as amended, has been given broad regulatory power by the Congress over virtually all phases of civil aviation, including regulations establishing airman qualifications, it would seem to us incongruous to separate the Board's regulatory powers with respect to medical requirements from the main body of other and equally important regulatory powers and place them under the jurisdiction of a single administrative officer called the Civil Air Surgeon, who would appear to have the power, under the language of section 1405 of the bill, not only arbitrarily to establish "minimum standards of mental and physical fitness for civil airmen" but also have arbitrary power over "the issuance of medical certificates to civil airmen and over the amendment, suspension, or revocation of such certificates." We believe this goes much too far in the delegating of power and authority to one person.

Summing up the Department's position, we recognize the importance of the studies and research contemplated by this bill, but it is our opinion that already existing and active aeromedical research facilities, projects, and studies should be carefully evaluated before determining what legislation, if any, is needed. It is for these reasons that the Department of Commerce does not favor enactment of this bill—certainly we do not favor its enactment at this time.

Again I would like to say that I appreciate the opportunity of expressing the views of the Department on this important subject. In this brief time there may be many questions I have not covered and which need to be enlarged upon or explained. If there are any such questions I will be glad to answer them if I know the answer. If not, I have with me medical experts from CAA staffs who I am sure will be much better able to answer such questions than am I.

I want to also add that if there are any questions in your minds which we cannot answer at this time, or if there are additional facts that might be helpful to you, you may be assured that every effort will be made by me and my staff to bring these answers and facts to you as promptly as possible.

Mr. Chairman, I would just like to add that I agree in general with the statements that Dr. Ashe made. This is a most important area. It is my feeling that until we get the report from the Flight Safety Foundation and from the American Medical Association, that we really at this point are not in a position to go ahead too fast.

But as soon as we get these reports I for one feel it is most important we move forward and fast, and with a positive approach. I can assure you on behalf of the CAA that we are going to do just this, because this is a most important area and we can't afford to just sit around and see what happens. We have to be positive in our approach in this problem.

Senator MONRONEY. You are not satisfied with today's methods of handling experience, proficiency, understanding of the medical problem presented today and the problems you will meet in the very near future?

Mr. PYLE. I feel very definitely, Mr. Chairman, that we have to go forward at an accelerated pace in getting the job done, and prepare for the jet age.

Senator MONRONEY. In other words, the objectives of Dr. Ashe and yourself are the same, in improving medical understanding. All that remains is the question of mechanics that should be used in the bill?

Mr. PYLE. That is correct.

Senator MONRONEY. You feel that without legislation it can be handled by maybe stepping up the appropriations and staffing of your own medical service, is that correct?

Mr. PYLE. That is correct. And I feel it is incumbent on our agency, the Civil Aeronautics Administration, to get this job done as far as we possibly can.

Senator MONRONEY. And that you also would be able to rely on the whole medical progress that could be made by contracting with such schools as you now contract with—Ohio State University, the New York Safety Foundation, and others—rather than the expenditure of two and a half million dollars for a physical plant plus the Government operation of the experts and technicians and medical people who would have to be drawn into such an operation and remain there for a number of years to whip those problems?

Mr. PYLE. Yes, sir.

Senator MONRONEY. Is that the prime difference?

Mr. PYLE. That is correct.

Senator MONRONEY. Dr. Ashe feels that these should be set up separately and give you the opportunity to develop your own techniques, your own understanding, and you feel that you would do better by going through the universities on grants-in-aid and bring about a study in that way?

Mr. PYLE. That is correct.

Senator MONRONEY. Senator Payne?

Senator PAYNE. The only thing I would like to ask is if it would be possible to submit for the committee's use, if you have it readily available at the office, a list of the various research projects that are being carried on, medical research projects that are being carried on at the present time. You mentioned it briefly on page 4 of your statement. You state that—

> No less than 58 areomedical research projects are being conducted by military and civilian organizations throughout the country.

I think it would be helpful if we could have a list of those.

Mr. PYLE. We will furnish it.

Senator PAYNE. Just a brief line or so to designate the particular field that they are going into. And I think it would also be helpful, at least it would be valuable to me, if we might have a breakdown of the present grants or aid that is being given by the CAA in connection with work of this type similar to that which is being carried on at Ohio State and Harvard or any other spots, what that involves in the way of financial assistance. And then if we could have finally, the

request of the Department this year for work in this field increased over what you had for last year? Or what is the status of that?

Mr. PYLE. We will furnish that information for the record, Senator.

Senator MONRONEY. Would you detail for the record, Mr. Pyle, the present way your Medical Division works, how it is organized, where it fits in, and certainly while you object to the Civil Air surgeon having power to suspend the authority of the Civil Aeronautics Board in safety matters, you have some way in which his studies and his findings are geared into the CAB on safety; do you not?

Mr. PYLE. I would like to give a brief comment, Mr. Chairman, and then I would like Dr. King or Dr. Stovall, either one, to comment more specifically on the setup of the Medical Division. But the Medical Division is 1 of the 4 divisions of the Flight Operations and Airworthiness Office.

Senator MONRONEY. What are the other three? You said it is 1 of 4.

Mr. PYLE. It is 1 of 4 in the flight operations. Mr. Keeley, could you answer thaat question specifically? The other three divisions in the flight operations?

Mr. KEELEY. Yes. The Engineering Division, Air Carrier Division, General Safety Division, and Medical Division.

Senator MONRONEY. Medical Division?

Mr. PYLE. In other words, it takes care of general aviation as against air carriers. Air carriers is a separate division. The Medical Division is headed by Dr. Stovall, who is responsible for the function. I could read them but I am afraid it would take too much of your time. We could also submit it for the record here.

In brief, the principal responsibility of the Medical Division is to develop the proposed civil-air regulations. Those are developed as a position by the Civil Aeronautics Administration and then forwarded to the Civil Aeronautics Board who promulgate the regulations, work with us and other agencies through various devices to find out what in their opinion is the best type of regulation to have, and then issue them as a Board regulation, and incorporate it in the civil-air regulations.

The Division is also responsible for developing technical publications and instructions; developing programs and objectives which are administrative procedures within the flight operations and airworthiness; to develop policies and procedures; evaluation of aviation medical activities; participate in field activities, maintain aviation medical records; and, lastly, they are responsible for research and technical development, and evaluate the need for, conduct or give technical direction to, aviation medical research on behalf of the Civil Aeronautics Administration.

This is a very brief summary which will be elaborated on by the official document that sets forth the Medical Division.

Senator MONRONEY. Do I understand correctly that there is a letter from the CAB to the CAA that governs the CAA medical policy and largely puts the medical decisions under the Office of the General Counsel of the CAA?

Mr. PYLE. I don't believe I understand the question.

Senator MONRONEY. Is there a letter in existence dating back some length of time, from the CAB, which largely put the medical service under the General Counsel of the CAA?

Mr. PYLE. I am not familiar with such a letter. If there is I certainly will become familiar with it. Secondly, the Medical Division reports to the Director of Flight Operations and Airworthiness and is responsible to him and to me.

Senator MONRONEY. He reports direct to you?

Mr. PYLE. He reports to the Director of Flight Operations. Under the procedure, the General Counsel's Office does assist in the drafting of regulations, in putting it in the proper form. It is the office we look to to be sure that what we are trying to say is properly said. But they do not have any control or take any position with respect to the substantive part of what we are trying to say. They advise; that is all.

Senator MONRONEY. But they advise, though, as to what the medical decision should be as well as what the language should be in the issuing of these regulations?

Mr. PYLE. That is right.

Senator MONRONEY. In other words, if you write the language, sometimes you can control what the intent of the regulation, the medical regulation, is?

Mr. PYLE. I agree.

Senator MONRONEY. Hasn't there been some scuffling back and forth over this letter that originally came down some time ago and that you were trying to clear up to put it back under the medical people where they would be more or less autonomous in that matter?

Mr. PYLE. I will have to confess, Mr. Chairman, that I don't know the background of this letter. On the other hand, I do not feel that the legal counsel can properly have any effect over the substantive part of what we are trying to say in legislation. Their assistance is to be sure that we say what we want to say. If there has been any of this going on, I think it will be corrected.

Senator MONRONEY. I wish you would look that up.

Mr. PYLE. I certainly will, sir. And would you like a report on that point?

Senator MONRONEY. Yes; I would.

Mr. PYLE. I will furnish it.

Senator MONRONEY. If there has been a letter from you to go out to modify the policy which was established some time ago, which a lot of people really believe gives the authority to the General Counsel instead of to the Medical Director.

What is the title of the chief medical officer?

Mr. PYLE. Director of the office.

Senator MONRONEY. What is his salary?

Mr. PYLE. Dr. Stovall, would you answer as to the correct title?

Mr. STOVALL. Chief of the Medical Division. The grade is GS–15.

Senator MONRONEY. This provides for GS–17, I think, for the Surgeon General, and an assistant GS–15.

Mr. PYLE. Yes, sir.

Senator MONRONEY. Counsel would like to have either Dr. Stovall or someone from your shop detail how the examinations of pilots—and control tower operators, if examined—are met.

Mr. PYLE. Mr. Stovall?

Senator MONRONEY. State your name for the record.

Dr. STOVALL. I am Dr. Stovall, chief of the medical division, CAA.

In answer to your question, Mr. Chairman, a physical examination of all civil airmen is conducted by medical examiners, some of whom are appointed individually and some of whom for the lower grades are on a mass basis. By that, I mean any competent licensed physician.

Senator MONRONEY. By a mass basis, do you mean sportsman pilots?

Dr. STOVALL. Blanket authority, I should have said.

And in both instances the examination is conducted and reported upon, with the report coming forward first to the region and then to the Washington office.

If the applicant is regarded as qualified, he is issued a medical certificate by the examining physician. In the case of the designated examiners, the action is final unless we have a difference of opinion by reason of former record or sometimes a failure to observe the proper procedure.

In the case of the family-physician type of examiner, the examination action, that is, the report action, is subject to challenge for a period of 90 days. If we are unable to report back in 90 days for any reason, or if the report is reviewed and found to be correct, the action stands for the full 2 years, that is, from the date of examination.

In the event the applicant is not favorably considered, a certificate is not issued, and a denial may be issued at the regional office or at our office in Washington. If the applicant accepts the decision against his certification, the action stands. He has the right of appeal for reconsideration. A number of these are finally certificated on the basis of further examination, recovery, and additional information. On the basis of experience, perhaps.

On the other hand, there are others that we have to remain firm in, and the applicant then appeals to the Civil Aeronautics Board, which have the final authority as to what will be done.

Sentor MONRONEY. But they have an appeal from the original examiner to another doctor if they wish, for a complete new examination without prejudice to the first examination?

Dr. STOVALL. No, sir; that isn't exactly so. It isn't in the formal procedure. We act on this basis: That we are always willing to accept any additional medical information. By the same measure, then, the applicant may go to some other doctor and his report be available for consideration, in which case the evidence will all be considered in toto. Even when we issue a denial we advise the applicant that upon submission of additional information we will be glad to reopen the case.

Senator MONRONEY. But the pilot being examined is entitled to know all the findings, and if he is denied his license on the examination.

Dr. STOVALL. If he asks for it specifically. From an administrative standpoint we have found, even though we use registered notifications, that it has not been a good practice to advise without request as to why he was denied. He will generally be advised through his physican. But that information is available to him if he asks for it specifically.

Senator MONRONEY. What degree of disability or whatever is permitted on it? Does he have to meet every single check point 100 percent?

Dr. STOVALL. No, sir. The flexibility is great in all standards, and where there is a specific measurement—for instance, in vision,

where we allow a reading of 20–50, correcting to 20–20, in air transport and class 2 of the commercial group, the applicant, upon a demonstration of his ability to perform, as judged by the testing inspector, may be issued a certificate even though he has a total loss of vision in one eye, for example.

Or if he has an amputation of a foot or a leg, if his ability to perform is demonstrated to the satisfaction of the testing inspector, then he will be issued a certificate, perhaps with limitations, but certified nevertheless.

Senator MONRONEY. How often are these qualifications that they have to pass—that are written up—revised?

Dr. STOVALL. There have been minor modifications, about four through the years, but they are substantially the same as they were prescribed for the Bureau of Air Commerce in 1926.

Senator MONRONEY. Only 4 or 5 minor adjustments?

Dr. STOVALL. That's right.

Senator MONRONEY. That would be from 90 miles an hour to 600? Is that right?

Dr. STOVALL. That's right.

Mr. PYLE. This, Mr. Chairman, is an area that must be looked into.

Senator MONRONEY. It is amazing, really, when your maximum number of passengers that you are carrying will probably be not more than 10 or 12 in a trimotored Ford or Fokker, at 90 miles an hour, with a landing speed of around 45 or 50 miles an hour, to think that, as I understand it, primary medical qualifications are the same today as they were then.

Dr. STOVALL. Modifications have been toward leniency.

Mr. PYLE. This is the reason why this must be dealt with immediately, Senator. This is where we are in agreement entirely with the objectives of this bill.

Senator MONRONEY. Can we afford to wait until you get this air-safety report?

Mr. PYLE. A lot of work is going on right now in this area.

Senator PAYNE. In other words, you have undertaken work on this leading up to the changes that appear to be needed?

Mr. PYLE. Yes, sir.

Dr. STOVALL. There is one part of your question that I did not answer. You included air-traffic-control personnel. They meet the second, or class 2, requirements. The procedure is exactly the same as for any other airman, as far as examination is concerned.

Senator MONRONEY. Does that include navigators?

Dr. STOVALL. Navigators, radio operators.

Senator PAYNE. Flight engineers?

Dr. STOVALL. Flight engineers; yes, sir.

Senator MONRONEY. Give us the three classes of medical certificates.

Dr. STOVALL. It is 1, 2, and 3. Class 1 being the air-transport group; that is, the air carrier. Class 2 is commercial, which includes the commercial pilots, air-traffic-control personnel, flight engineers, and the navigators. Class 3 is the student and private-pilot group. And then included parallel, of course, is the lighter than air, free balloons, and so on, in the same classification.

Mr. PYLE. Senator, I think it might be helpful if Dr. Stovall, for the record, would also point out the different periods that those certificates are good for.

Senator MONRONEY. Yes.

Dr. STOVALL. Class 1 is 6 months; class 2, annually; and class 3 each 2 years.

Senator MONRONEY. But the basic medical examination, heart, sight, various things, is the same each 6 months; is it not?

Dr. STOVALL. That's right.

Senator MONRONEY. Is there any different test made as the age of the pilot or operator becomes more advanced?

Dr. STOVALL. Not a great many. There is a closer attention paid to the blood-pressure readings and in the cardiac field in general, is about all.

Senator PAYNE. What about reflexes?

Dr. STOVALL. The reflexes are checked in any event. He is judged on the basis of how well he reacts. In other words, his psysiology, and not particularly his chronological age.

Senator PAYNE. What about following an accident? Is there a medical check made then?

Dr. STOVALL. No, sir; not routinely. The only provision we have for that is in one section, 40; there is a provision that a pilot will not operate an aircraft during the period of a known physical deficiency that would place him in a less degree of physical fitness that when he obtained his medical certificate, and the responsibility is largely up to him. Of course, in a glaring case, where the inspector or the base operator, or someone who has knowledge of his condition, may insist, then it becomes a third-person affair. But in most cases it is up to the individual. If we know about it, then we will tell him until this is cleared up that he must have further medical examination.

Senator PAYNE. Wouldn't you think it might be advisable for a mandatory check to be made?

Dr. STOVALL. I would favor it very much, sir.

Mr. PYLE. Subsequent to an accident, Senator?

Senator PAYNE. Yes.

Dr. STOVALL. Following an accident?

Senator PAYNE. Yes. Granted the fact that a good many of them, of course, are due to mechanical failure.

Dr. STOVALL. Some of them are minor. Of course, you have to use judgment. But if——

Senator PAYNE. It might serve a basis that would be helpful.

Dr. STOVALL. You asked about the extent of the examination. We have, by necessity, a screening-type physical examination, because this examination is paid for by the applicant, and obviously we can't ask the man each time he is examined to go through a full clinical examination, you might say, through a major clinic. But we do have a screening examination. If, for instance, we have an area of chest or heart or kidneys, or what not, that need further examination, then he is asked to have a specialist's report. And that is an economical way of handling it. The only trouble that we have encountered in that particular area is that we don't always get the danger signal.

Senator MONRONEY. In other words, if you had a general examination, which perhaps would have to be paid for by the airline or

something like that, if it was more expensive, you would have a better clinical knowledge of the operator before trouble might develop?

Dr. STOVALL. That's right. If we had a type of examination in which the man was periodically—we wouldn't say how often—put through a complete physical examination, naturally it would turn up conditions in their incipiency in advance that would help us take corrective action, whether it was medical advice on how to correct it or action to keep him from flying, depending on the degree.

Senator PAYNE. You mean a regular, thorough, clinical examination?

Dr. STOVALL. Yes, sir.

Senator MONRONEY. The airplanes get a regular 2,000-hour complete check on every single part of the plane; don't they?

Dr. STOVALL. That is, I believe, the rule of the day. That is in somebody else's field.

Senator MONRONEY. The man who is running it doesn't get that, and what he does get he has to pay for himself.

Dr. STOVALL. That's right.

Senator MONRONEY. I think Dr. Ashe mentioned that some of the airlines did have their own medical departments. What is the extent of those?

Dr. STOVALL. At my last information, the air carriers that have their full medical department—there are about 6 or 8. I may have to stand corrected on that group. There are still others who utilize the medical facilities of other airlines. Their examination naturally is more thorough than the screening examination we are able to do.

Senator MONRONEY. And for other airlines as well? In other words, they are specialists in the examination?

Dr. STOVALL. Here, again, I am speaking without too great detailed knowledge. But some of the smaller airlines very frequently utilize the services of the major carriers, the medical departments, to examine their pilots or help them out on medical questions.

Senator MONRONEY. But you think most of the major airlines do have some degree of their own medical service; is that correct?

Dr. STOVALL. Of the total, between 6 and 10. I don't know just what the latest count is.

Mr. PYLE. Senator, I would like to comment on that point. The major carriers, about 50 percent of the major carriers, have very extensive medical facilities, and I am quite familiar with some of them. Their basic philosophy that they have a great investment in the personnel, the pilot personnel, flying personnel, and they want to work with them to protect this investment.

As a result, they have very extensive facilities. And I think this is a field where we can work even more closely with them.

Senator MONRONEY. You think those facilities are expanding; the airlines are undoubtedly aware of the new problems to be met in the supersonic range, are they not, and are probably doing some work on their own to get ready for it?

Mr. PYLE. I would not be in a position to speak to this, but I did merely want to point out that some very extensive effort is made in this general area by some of the more progressive companies.

Senator MONRONEY. Do you have a question?

Mr. BAYNTON. Can applicants for all 3 of these certificates, 1, 2, and 3, go to their family physicians?

Dr. STOVALL. Classes 1 and 2 must go to a designated examiner. The student and private pilot, which is the class 3, have the choice of going to the family physician or any other physician of their choice, which, of course, might be a designated examiner.

The statistics on that is that 5 out of 7 go to the family physician. The other two go to designated examiners of their own volition. That is class 3.

Mr. BAYNTON. Do you get a report of all of these examinations?

Dr. STOVALL. We have reports of all examinations where we request them. We have a reason to believe at times that some of them don't come in. But by and large they do. They come in to the tune of about 180,000 a year.

Mr. BAYNTON. Do you have any instances—I suppose this you would have to find almost by accident—where student pilots are original applicants for your No. 3 class and have shopped around until they found a doctor that would give them a certificate?

Dr. STOVALL. We have it quite frequently in which the student group particularly, that is the class 3 group, do shop around and use a succession of doctors in order to keep their certification.

Mr. BAYNTON. Do you have any facilities for policing that situation?

Dr. STOVALL. Other than by mail, and by advising the agent of a violation or a failure to obtain proper examination or having had an improper medical certification, it depends mostly on the applicant's willingness to surrender his certificate at our request by mail.

Mr. BAYNTON. So it is pretty hard under your present setup to stop that type of pilot from flying, unless you catch up with him?

Dr. STOVALL. They stay ahead of us pretty fast. It takes about upward of a month or, as you noticed, we said 90 days, to challenge on that type of certificate. And it takes that long sometimes to process a case. And these fellows have found out about it, so they will send in the certificate we ask for, and in the meantime we get one from some place else.

Mr. BAYNTON. You mentioned your load, I believe you said, of 180,000.

Dr. STOVALL. One hundred eighty thousand annually. That is the total. That is all classes.

Mr. BAYNTON. How do you select your field examiners? I don't know whether I am using that term correctly?

Dr. STOVALL. Are you speaking of the designated group?

Mr. BAYNTON. Yes.

Dr. STOVALL. We select them according to the need of the local community, and that is either brought to our attention by the operator or by perhaps one of the agents or inspectors. And then we have the names of interested physicians and we have a set of requirements that we exact of our applicants. And where we have the proper qualified people available, we will use physicians who have had training in aviation medicine. Preferably one who has had Board certification. But they are very scarce.

And frequently we will have to take a physician who has no qualifications in aviation medicine at all, because it seems that the demand for an examiner in a locality is so great as to justify our using a good physician, which is the best way I know how to describe it.

In other words, we use the best that we can get. And these designations are for 1 year. We send our designated examiner a guide, which is an interpretation of the civil-air regulations and contains techniques of the examination.

Mr. BAYNTON. In other words, you try to offer him some information—I won't call it training.

Dr. STOVALL. It is information we provide for him in the guide for a medical examiner; yes, sir.

Mr. BAYNTON. Do you have any facilities for training for these men?

Dr. STOVALL. I am sorry, I didn't hear that.

Mr. BAYNTON. Do you have any additional facilities for additional training for these men?

Dr. STOVALL. The only thing we have is what Dr. Ashe mentioned. The postgraduate course at Columbus, Ohio. There have been three, and we are coming up with the fourth. There was one very short course put on at UCLA, at the University of California in Los Angeles, last year. That was the first.

I would not at all fail to mention the experience and training that so many of our examiners have had in the military service. They served as flight surgeons during the war, and some even during World War I. And they are good men, there is no doubt about it. But these two schools are the only provision we have for formal training.

I might mention, to be complete, the group meetings that we have around the various parts of the country in connection with annual medical meetings. For instance, the Texas State Medical Society has a section on aviation medicine, and those examiners meet. Unfortunately, the men who need the training don't come. That is the difficulty we have in that area.

Mr. BAYNTON. So that your supervision may be a little loose because of your facilities at the moment?

Dr. STOVALL. It is not what we would like to have at all.

Mr. BAYNTON. Do you collect information, or do you have information as to accidents caused by medical defects in pilots?

Dr. STOVALL. We have two studies that we use. One is which we made a study of the structural and visual defects. By structures, I mean, for instance, a stiff joint or amputated foot or loss of fingers, stiff shoulders, and whatnot. That was done some 4 or 5 years ago. We found that the accident ratio was 1.8 percent greater in those whom we had permitted to fly. That was a selected group, as you must understand, because it was people that we had waived. And then we have, percentagewise, a series of some 5,000 cases in which people with organic defects—that is, disease of the heart and other systemic diseases—as high as 4 and 5 times the number of accidents, depending upon the type of defect.

Mr. BAYNTON. So you did have some statistics that indicated——

Dr. STOVALL. On a mass basis. Individually; no. We have cases—and I did compile a list recently—in which to the medical man he would feel that at least there was some relationship between the man's medical condition and his accident, though it was not formally investigated on that basis.

I might state in connection with the Flight Safety Foundation study one of the terms of reference, one of the projects within the

study, is the autopsy of people involved in fatal accidents. One of our States is permitting it. He had found a very close relationship in automobile accidents, and he wanted to carry this on into the aviation field. It is under study at the present time. Other than that there are no formal studies.

Senator MONRONEY. How many medical officers do you have under you, Dr. Stovall, in the CAA?

Dr. STOVALL. There are a total of 54 personnel, field and Washington, including the office at Ohio State. There is 1 medical officer in each of 4 regions. There are 4 doctors of medicine in Washington, 2 physiologists, 1 psychologist. That is my staff.

Senator MONRONEY. Are you doing any work in the visual things?

Incidentally, I would like to put in the record at this point this excellent article from the New York Times of Man: Barrier in Flight, which appeared yesterday in the New York Times, speaking of the many problems that confronted medicine with supersonic speed. He said:

> Another real problem is latency of vision. A flyer traveling at a speed of 1,800 miles an hour would cover a distance of almost a mile from the time of first appearance of an object to the time he was able to effect a control movement of his aircraft. If he flew into a cloud 100 yards deep he would actually have emerged from the far side before the message from the retina of the eye could register on the perception center, making him aware that he had entered a cloud.

It is quite an article about some of the problems that are being met and which we will undoubtedly hear about from the military people. I wonder if you have given any thought to this high-altitude flight as it affects the eyesight of the pilot?

Dr. STOVALL. I don't believe to high-altitude flight, as such, but we do have projects on what a man can see from a cockpit. That is one of the projects that we have going on presently. Dr. King will tell you about that, that we have at Ohio State laboratory. I should like to mention that the man who talks best on just what a man sees and what he should have seen in the clouds, and so on, is in the audience now, General Byrnes. I have heard him make a speech that really pinpoints that problem very sharply.

Senator MONRONEY. Going back a minute to these airlines that have the excellent staffs and all, and do the examinations for themselves and others, there always is a chance, however, that with labor relations being what they are, the pilots might not be willing to accept the medical findings as conclusive, if it is run by the airlines. Is that not true?

Dr. STOVALL. That is in the labor area, and I don't like to give you an answer one way or another. I would not evade the question at all——

Senator MONRONEY. Let me ask Mr. Pyle.

Dr. STOVALL. I do say this: That where we do have examinations, both by the company and by our office, the pilots do seem very well satisfied with type of medical advice they are able to obtain. I think by and large they regard it as most helpful to them. I know, as far as our office is concerned, we are very glad to have the work of the airline companies as a bulwark because we know that they are looking after these people, and we feel that we are not the only protection that the pilot himself has or that the public has. There is the

assurance that the company has a good medical program, and that in itself is of great value to us. We are worried in those cases where the carriers do not have a medical program, because we know the fallacies of the screening examination and the evasions that can be carried on. So it is a great solace to have these medical organizations within the companies.

Senator MONRONEY. But there must always be an opportunity to go to the Board, as there was in this one case that I was informed of, where, after a strike at National Airlines, 17 pilots were ruled not fit, apparently by the company, and when they took their problem to the CAB, a neutral appointed group submitted them to Johns Hopkins and all 17 were found to be personally fit and returned to duty with back pay.

Dr. STOVALL. Our interest in that particular matter—that was several years ago—was to determine whether the men were physically qualified or not. So it was an independent activity as far as our office was concerned and what the airline did about it ultimately, because we wanted to satisfy ourselves as to whether the men were or were not physically qualified. That was the extent of our interest. What the company decided to do about it was their business, and not ours.

We wanted to satisfy ourselves that the men were or were not physically qualified. Whether they were or were not issued a medical certificate would depend solely upon that. And a number of them were physically qualified subsequently.

Senator MONRONEY. I believe they were all found to be physically qualified.

Dr. STOVALL. I was under the impression there were 1 or 2 that weren't.

Senator MONRONEY. My impression is that they were all found to be qualified. Most of them, in any event, were found to be qualified after they went through Johns Hopkins; is that right?

Dr. STOVALL. That is true.

Senator MONRONEY. So you can't rely entirely on the development, even though it may be good in preserving the health and keeping up with medical science on the airline companies, but you must have your own facilities where you can really go ahead and find out whether they are properly examined and whether their being passed is O.K.

Mr. PYLE. Ours is the basic responsibility. We can't shove that off on anyone else.

Senator MONRONEY. But you do delegate it now to the airlines where they wish to do it; don't you?

Dr. STOVALL. No, sir; we do not. Only one time in the history of the medical certification do I recall when the authority was delegated, and it was delegated in this manner: That we would accept alternately the physical examination done by the company. Let me explain. We require examination each 6 months. The companies usually have their major examinations annually.

So we agreed, as a matter of expense and saving to the pilots, that we would accept alternately, to satisfy our requirements, the annual company physical examination. That proved very unpopular and was very quickly gotten rid of. Otherwise, we do require always the examination ourselves. So there is a duplication in one sense, and that

is, the man is examined twice, once by our examiners and once by the company. That is, during a given period of time.

I think it might be well to point out that we examine for minimum physical qualifications. The company on the other hand may very well be examining only from the standpoint of longevity; how long will this man be useful to them. So they may exact a higher standard as a matter of company policy than we exact from a safety standpoint.

So that does give us a difference of opinion. It gives cause sometimes for the company to not hire a pilot when we have said that he is O.K.

Senator MONRONEY. Do you mean maybe not hire him or not advance him to some faster equipment?

Dr. STOVALL. That is more in company management with which I am not familiar.

Senator MONRONEY. You have the same examination for a DC–3 as you have for a DC–7?

Dr. STOVALL. Yes, sir.

Senator MONRONEY. If he is qualified to fly a DC–3 he is qualified under the examination to fly a DC–7?

Dr. STOVALL. Yes, sir.

Senator MONRONEY. Unless this new pattern is brought in before the 707 or the DC–8 is brought in, that will still be the standard of testing for the pilots in the jets; is that correct?

Dr. STOVALL. I would answer "Yes" to your question; unless there is a change we would use the class 1 standards as far as we now know. In other words, we have no additional information that would cause us to give him a more strict examination.

Senator MONRONEY. We are permitted to waive in all classes certain physical defects, depending on the man's degree of responsibility. So it is conceivable that for jet operation that we would not waive a man in any degree, and he would be required to follow or adhere strictly to the standards. I don't say that that would be the policy, but it could very well be.

Mr. PYLE. This is the very area, Mr. Chairman, that we have to look into, and quickly. In other words, this is part of the problem that our research is going to be directed toward, to finding the answer to this question. It is a very good question.

Senator MONRONEY. Senator Payne?

Senator PAYNE. I have nothing further.

Senator MONRONEY. Do you have anything further?

Mr. BAYNTON. I gather from your testimony, doctor, that you would not designate a company doctor today?

Dr. STOVALL. We prefer not to. You are speaking of a company doctor. You mean for the air carriers?

Mr. BAYNTON. That is right.

Dr. STOVALL. We prefer not to for the reason that it can conceivably place him in an embarrassing position. I think that may be more theoretical than real, but conceivably it could be an embarrassment if he had to take 2 positions, 1 for the Administrator and 1 for his employer. We do have in the instances, let us say, of a large clinic, in which we have designees, medical designees, in order to use the facilities of the clinic; and they also serve some of the major airlines. We have a very definite use for company physicians, if you wish to so

designate them, for instance, of Boeing and Lockheed, because these men are doing very great work in just the field we need to have developed. So we use them as our designees. But we try to let them always know if there is a decision, when it comes to deciding for the Administrator or their employer, that we expect the decision to be in favor of the Administrator's position.

Mr. PYLE. I think the point that you are trying to bring out is that, in the case of the air carriers, we do not follow this practice. But with test pilots and others, the designee system is used from time to time.

Is this not the distinction?

Dr. STOVALL. That is the distinction, except that there is no stated policy against designating a medical director of an airline. There used to be rather a firm policy against it, but it has not been stated for many, many years.

Senator MONRONEY. If the pilot objected to it, or the person being examined would ask for an independent test, he would have no trouble getting it; would he?

Dr. STOVALL. That is right. Under our practice of accepting medical evidence from whatever source that we consider reliable.

Senator MONRONEY. But if he is examined by——

Dr. STOVALL. We reserve the right to accept it or reject it.

Senator MONRONEY. But if he is examined by a company doctor, then anything that they have in their files, of course, would be submitted to the——

Dr. STOVALL. There is a strong objection to making available—I don't know whether that is so strong at the present time as it was at one time—but there was a very strong objection of letting the Administrator medical staff know what the company medical staff had. But we haven't had any difficulty in that area of any great moment in many years. We have a very close working relationship with the pilots and with the medical directors of the airlines. I am sure that there is material that they feel that we don't need. I don't know of any occasion in which we have specifically asked for a report on a pilot. We regard that much in the position that we like to have, we must have, the reports that come to the Administrator. We must regard it as confidential material. But, for the most part, our working relationship has been very good.

Senator MONRONEY. Senator Payne?

Senator PAYNE. No questions.

Senator MONRONEY. Thank you very much, Dr. Stovall, and thank you, Mr. Pyle. We appreciate it. We may, before we finish, like to call you back. You may feel free to go downtown about your work, if Dr. Stovall could remain here.

(The newspaper article referred to above follows:)

[The New York Times, Sunday, March 31, 1957]

MAN: BARRIER IN FLIGHT

A VIEW OF AVIATION MEDICINE'S RESEARCH INTO THE PROBLEMS OF SPEED AND ALTITUDE

(By Howard A. Rusk, M. D.)

On successive days recently, Navy jet aircraft established transcontinental speed records from east to west, west to east, and on round-trip flights. The

west-to-east record was made by a twin-jet Sky Warrior (A–3RD) that flew from Los Angeles to Miami in 3 hours 39 minutes and 24 seconds at an average speed of more than 641 miles an hour. The flight broke the record set 2 years ago by an Air Force F–84F Thunderstreak by 8 minutes.

These new achievements in speed have highlighted once again the importance of research into the human elements in flight. Man's ability to tolerate the unnatural environment of flight is the primary limiting factor in aircraft speed, altitude, and maneuverability. These are also the factors that mean victory or defeat in war.

Medical science has been interested in the physiological and safety aspects of flying since man's first flight. An American physician, Dr. John Jeffries, was copilot of the first balloon flight across the English Channel in 1795.

The most recent dramatic episode of medical aviation research was the test of speed, blast, and crash made by an Air Force physician, Lt. Col. John P. Stapp, by riding a rocket-propelled sled 632 miles an hour and stopping in 1 second plus.

Maj. Gen. Dan C. Ogle, Air Force Surgeon General, points out that having operationally surpassed the speed of sound in our present-day aircraft, the next mythical barrier is that of heat. At low altitudes, speeds of 600 miles an hour may develop air-friction heat that will raise cockpit temperature 86° F. above that of the outside air. At speeds already foreseen, increases of 400° to 500° F. will be produced even in the rarified atmosphere at 100,000 feet.

Another real problem is latency of vision. A flier traveling at a speed of 1,800 miles an hour would cover a distance of almost a mile from the time of first appearance of an object to the time he was able to effect a control movement of his aircraft.

MESSAGE SLOWER THAN SPEED

If he flew into a cloud 100 yards deep he would actually have emerged from the far side before the message from the retina of the eye could register on the perception center in the brain, making him aware he had entered a cloud.

Researchers already know a great deal about what happens to the human body at high altitudes unless it is protected. Flying up to 8,000 feet at a moderate rate of climb presents no particular problem. The only sensation usually is a ping in the ears. Unless acclimatized to such altitudes, as are the Indians of Peru, most pilots will lose consciousness at 18,000 feet without oxygen.

Even with tight-fitting oxygen masks, communication becomes a problem at more than 30,000 feet. As the flier must breathe oxygen under pressure, the natural breathing process is reversed, and the flier must make a positive effort to exhale. The Navy has recently learned through research that if the flier's own earphones are arranged to provide a short delay before he hears his own words, he will speak more distinctly.

At 63,000 feet an unprotected flier's blood would boil as the air pressure (57 millimeters of mercury) equals the vapor pressure of water at body temperature.

From 80,000 feet up, man can fly only in a sealed cabin with its own built-in climate and air supply. Oxygen in the outside air becomes poisonous as ionizing rays turn some of it into ozone with 3 atoms to the molecule rather than 2.

The world's record for manned flight, it is understood, was set at 126,000 feet last summer in the Bell X–2 research rocket plane piloted by Capt. Ivan C. Kincheloe. In a later flight in which it crashed, the Bell X–2, it is understood, established a new speed record of 2,100 miles an hour. A new research plane now under construction, the X–15, is expected to reach speeds of more than 3,000 miles an hour and altitudes of 50 miles—264,000.

SIMULATED ALTITUDE TEST

Last December, at the Wright Development Center, Dayton, Ohio, Air Force Maj. Arnold I. Beck achieved a simulated altitude of 197,770 feet (38 miles) in a 50 cubic foot steel pressure chamber. Major Beck reported complete comfort in his pressure suit.

This last week the Soviet Union released photographs of a dog named Malyshka (Little One) that the Russians said had flown in space. It could not be determined if Malyshka is 1 of the 2 dogs that Prof. Alexi Pokrovkey, of the Soviet Experimental Institute of Medicine, reported in 1955 had traveled 68 miles up in a rocket. In experiments at White Sands, N. Mex., the United States Air Force sent 5 monkeys and 3 mice 80 miles aloft in pressurized rocket heads with no apparent ill effects.

As would be expected, the great bulk of research in aviation medicine is conducted by the Air Force and Navy directly or through contracts to universities and other research institutions. A significant development in such research was the announcement last month of the establishment of the Harvard-Guggenheim center for aviation health and safety at Harvard University's School of Public Health. The new research-teaching center will begin operations next fall under the direction of Dr. Ross A. McFarland.

Our Nation can make no more important investment. It not only saves lives and dollars, but may be the decisive factor in deterring aggression or in victory in the event of war.

Senator MONRONEY. I would like to ask Brig. Gen. Victor Byrnes to come forward.

General, we welcome you to our committee. You have done great work for the Surgeon General on air development and research on the medical side. We would be very happy to have you give to the committee the benefit of any information that you might have.

STATEMENT OF BRIG. GEN. VICTOR A. BYRNES (MC), USAF, DIRECTOR, PROFESSIONAL SERVICES, OFFICE OF SURGEON GENERAL, USAF

General BYRNES. Thank you very much. If I understand the courtesy under which I was accorded the privilege of testifying, it is to the effect that I would talk about aviation medicine and its principles without making a statement either for or against the merits of the bill.

Senator MONRONEY. Yes. That we would like. That was one of the main reasons we wish you to be here, to give us some of the background of the problem, and what the military has found as they have entered this difficult field.

General BYRNES. The matter under discussion is related to both the research and the administration of a physical qualification certifying program. It is essential to have the research to establish the standards that you require for the type of operation you are going to have, and then it is essential that you have a satisfactory administrative means for carrying out certification of flying personnel.

When you certify that an individual is physically qualified for flying, you are essentially stating three things: First, that the man has the necessary characteristics to utilize the aircraft in a safe manner, and, of course, in the military we have the additional certification that this man has the characteristics which will allow him to effectively utilize this aircraft for a military mission. This is not true in civil aviation, of course.

Senator MONRONEY. You mean that he has the courage to go through to an objective?

General BYRNES. Not only the courage, but that he has the physical characteristics, vision, for example, which permit him to utilize his aircraft effectively against enemy aircraft. This is a higher type visual requirement than you have just to take off the aircraft, to fly it somewhere and land it again. But the standards must be realistic for the flying task that is to be performed.

And there is one third thing that you are certifying when you put your name on such a piece of paper, and that is, so far as you can tell, this man will remain physically qualified until his next required physical examination. So you have to know of his capabilities and his physical condition.

It is preferable, of course, to have this verified by day-to-day observation by flight surgeons, but this is not always possible in some of the other fields of aviation activity.

Our experience has indicated the following things: First, that the examiner must be especially trained in aviation medicine. The field is such that medical training as given in medical schools and in the usual clinical practice of medicine does not adequately qualify a physician to pass on questionable cases.

Second, that any examination program must be carefully supervised.

Senator MONRONEY. Could you elaborate on that, that it must be properly supervised? Do you mean that, even though the examiner is qualified by additional service and experience in aviation medicine, his examination must be the result of consultation with some others?

General BYRNES. That wasn't exactly what I had in mind, but that the quality of his examinations must be rechecked from time to time in the Air Force by some individual from our headquarters. Individuals, by and large, are conscientious, careful, and so on, but they do a better job if they know that somebody else is watching.

The third point, that adequate equipment must be available, and adequate facilities, and that the individual doing the examination must have adequate time in which to accomplish it. This means that the press of other business cannot be so great that the crying child gets the lion's share of the time, and the examination is not adequately performed.

Then that the decision as to qualification must be made by the medical people, and that their decision must be the final one. This is true in the Air Force, and I think it is also true in the Navy, although I cannot speak for that branch. Legally the responsibility for making these decisions in the Air Force rests with the Chief of Staff. And he can reverse any decision we make if he wants to. The area has been delegated to the Surgeon General, with the authority to make these determinations, and, so far as I am aware, it has never been reversed by the Chief of Staff.

I think this is essential. There is no way that you can adequately educate a group of people who are not physicians and who are not in aviation medicine by appearing before them and giving them an adequate background upon which to make a medical decision. I think this one is more or less equivalent to putting a doctor on the bench and expecting him to make proper legal decisions on the basis of evidence presented to him. I believe this is true.

Perhaps with that statement of what I believe are the basic tenets in this problem, maybe someone would like to question me.

Senator MONRONEY. We would like to know all we can about some of the problems that the Air Force feels it faces in connection with the development of supersonic speed, vertical climbs, all the things that you have to do particularly in the long hours of one crew circling the world as they did in B–52's.

Do you find additional strains that have been placed on the human body that reach beyond the point of the average man's capacity to endure it?

General BYRNES. Yes, sir. We face, of course, problems that civil aviation will not face in the foreseeable future. And if I may digress for just a second from your question, the point has been brought out that perhaps the military laboratories could take over the re-

search load for civil aviation. I can state for the Air Force that we have so many problems involved with the new aircraft that we would be unable to expand our program to include further research on the types of problems which they are currently facing. Because of the shortage of funds and people, we have to direct our research to our particular problems. They have got to come first. And for that reason I am afraid we would not be able to help them much.

Such things as the operation of atomic-powered aircraft, the wearing of full pressure suits, which I suspect it would be awfully hard to get a civil-aviation passenger into; the problem of flying almost outside the atmosphere; the problem of heating of aircraft because of the extreme speeds; the problem of high "G" forces applied to the individual to the point of tolerance, which again civil-air passengers I think would fuss about; the problem of protection of our people against the effects from atomic blast; the problem of protection of their eyes, if we may talk about something in which I have been personally interested, in that particular area. Also, the problem of individuals escaping from aircraft at very high speeds at extreme altitudes—the tumbling that they get, the type of parachute descent they should make, and this sort of thing. This has pretty well saturated our laboratories with our own aeromedical problem.

Does this answer the question?

Senator MONRONEY. Yes. Do you have any idea what the cost of these aeromedical problems are that the Air Force operates with today?

General BYRNES. No, sir; this would be hard to compute, because there is a lot of it that is let out on contract to universities and other organizations.

Senator MONRONEY. There are universities then doing much of this work for the Air Force; is that correct?

General BYRNES. Yes; they are doing a lot of it. And we do as much as we can within our own laboratories, in addition. So that the cost of the program would include the pay of the people we have, and so on. It is a figure that I don't have readily available.

Senator MONRONEY. Roughly how many laboratories do you have?

General BYRNE. We have the School of Aviation Medicine at Randolph Field, with its radio biological extension at the University of Texas. This is a large operation. We also have the aeromedical laboratory at Wright-Patterson Air Force Base, with its extension, the Arctic aeromedical laboratory, up in Alaska. And also the Holloman Test Center, where John Paul Stapp, the fastest man on earth, conducts his rocket run. These represent the largest share of our Air Force Research Center.

Senator MONRONEY. In your research, you detailed the rather high standards of the physical requirements that you have to meet. Have you changed your physical requirements as the speeds of these aircraft and their altitudes have stepped up?

General BYRNES. I think perhaps there is a little misconception about changing physical standards with increased speeds. You see, the speed itself creates no particular problems unless you change the direction of the aircraft, or unless you are landing it and taking off. We have always required excellent vision in our personnel for their military job, and actually it is better than you need for landing and takeoff. When we need our best vision is in aerial combat. So the

standards as we have had them are perfectly adequate for landing the faster type aircraft. We have been more critical, of course, of such things as developing pilots if they are going to be placed in high-performance aircraft. This has more relationship to the cardiovascular system and that sort of thing than the other types of physical standards for flying as related to performance of the aircraft itself.

Senator MONRONEY. How about the reflexes and things of that kind? Do you find for these supersonic aicraft—which do change, if they are going to fly that fast and the direction changes—that you have to have men who have faster reflexes to be the type of pilots that you need?

General BYRNES. This is a subject in which all the military services have been vitally interested and still are conducting a great deal of research. Experience, you see, does a great deal for the individual. What we have tried to determine is the point at which experience no longer compensates for the decreased capability of the individual. And this has not been determined to date. We are still working on it. We are, the Navy is, and we have not been able to come up with any single physical measurement nor determination of age which will allow us to state at this age this man comes off; at this age he is all right. But we are still working on it.

Senator MONRONEY. It is still largely up to the individual and the degree of experience which he has had?

General BYRNES. Yes, sir.

Senator MONRONEY. In the military there is no such rule today requiring a man over 30, for example, to fly a certain type of fighter or jet?

General BYRNES. We have planning guides by which we plan that, as individuals get to different ages, they will be programed for different types of aircraft, if possible. But there is no cut and dried thing that says this man cannot fly this kind of an aircraft because he has reached a certain age.

Senator MONRONEY. They are examined closely on their ability to fly?

General BYRNES. Yes, sir.

Senator MONRONEY. And checked out, I imagine, as they fly?

General BYRNES. Yes, sir; they are.

Senator MONRONEY. In addition to passing the physical, and perhaps they have a test flight on a different type aircraft?

General BYRNES. Yes, sir. The standardization boards, you see, ride with the man at least once a year and sometimes twice a year, and they check his proficiency in the type aircraft which he is using.

Senator MONRONEY. Of course, they do that in the CAA, too. They give the fellows a check ride after they have had a full physical.

General BYRNES. Yes, sir.

Senator MONRONEY. Senator Payne?

Senator PAYNE. I have just one question.

Is a lot of the information that you are developing, these various research laboratories that you have, is any of that available to the civilian component, that is, to the CAA?

General BYRNES. Yes, sir; all of it is written up in project reports. They are all of them available to the CAA, and so far as I know they get all of the reports except perhaps the highly classified ones

which would be made available to their personnel who have the proper clearance.

Senator PAYNE. But those basically wouldn't interest them much because they would be dealing with matters at the tactical end of the operation?

General BYRNES. Yes, sir; they are. But there is much of the research which they use and do use. We would be interested in any research which they might develop. After all, we haul passengers, too.

Senator PAYNE. But you have enough of a load under the present setup so that you would not be able to very efficiently take on another load in the particular fields that they have to be concentrating on?

General BYRNES. Yes, sir; that is correct.

Senator PAYNE. That is all that I have, Mr. Chairman.

Senator MONRONEY. In outlining the details of your examination, you said that when they certify him as qualified, they must also certify that in their experience he will remain physically qualified until the next examination. That would indicate that they do go beyond just the immediate showing of the examination at that period?

General BYRNES. Yes, sir. I think that is essential.

You may have an individual who looks perfectly normal as he walks in and talks to you, and can pass your examination perfectly well, but if this individual has an abnormal electrocardiogram which would indicate to you that he probably has had a coronary attack, perhaps a small one, the chances of his having another one are much better than an individual who has had none, and for this reason this individual would be questionable to you insofar as his being well until his next examination rolls around is concerned. This is important, I think.

Senator MONRONEY. I notice you emphasized that. Another thing you emphasized is that an examiner must be trained in aviation medicine?

General BYRNES. Yes, sir.

Senator MONRONEY. All of your examiners of pilots for the Air Force are men who are trained in aviation medicine. You don't rely on the general surgeon or practitioner to make these examinations?

General BYRNES. We rely heavily on consultations with specialists in various fields by our flight surgeons, but the flight surgeon makes the determination of whether the man flies, not the general surgeon or someone else. I think that again this is important: There is a field of medicine here which is not adequately covered in our medical educational institutions. We train people in it. It has direct application to the flying task. We definitely feel that individuals must be qualified if they are going to tell whether an individual should fly or not.

Senator MONRONEY. And you mentioned adequate equipment, adequate facilities, and adequate time to make the examinations. Do you have specialized equipment in all of your places where your pilots are examined and where they are reexamined?

General BYRNES. Yes, sir.

Senator MONRONEY. A special apparatus that would indicate that?

General BYRNES. Yes, sir; we do.

Senator MONRONEY. Without violating security or anything——

General BYRNES. There is no security involved in this.

Senator MONRONEY. What types of equipment would that be that the ordinary practitioners wouldn't have?

General BYRNES. The average practitioner doesn't have an electrocardiograph, for example, and this is an important part of the examination, particularly in the individuals who are passing 40. He doesn't usually have an adequate apparatus for determining muscle balance of the eyes. He doesn't, in his practice, have a requirement for accurately determining visual acuity, so he usually determines it with an old chart with flyspecks on it up on the wall at the end of his office.

Some people have an inaccurate and wornout blood-pressure apparatus. This one is not so common, but it happens. There are other pieces of similar equipment—I am sorry I can't come up with them at the moment, but may I assure you that there are other and required pieces which many doctors do not require in their practice. They don't have to have it. But you have to have it to do this accurately.

Senator MONRONEY. The things you mentioned are just normal things that you find in a good clinic. There is nothing of a Buck Rogers nature that would show up a nervous disorder or any impending blood clots or things of that kind?

General BYRNES. No, sir. It just bears out, I think, my point that there should be adequate equipment. I don't mean to infer that it is terrifically unusual or terribly expensive.

Senator MONRONEY. There has not been anything developed which would give you any sure-fire apparatus in testing these pilots. It is the same thing that you have gone through on the heart, electrocardiograph, sight, and things like that?

General BYRNES. Yes, sir; but you must have adequate measuring equipment for them.

Senator PAYNE. It is a combination of all the known equipment that is available to reach the end degree that you are looking for?

General BYRNES. Yes, sir.

Senator MONRONEY. Any examination must be rechecked, you said. That is standard. The same doctor or surgeon does not examine the same pilot time after time without having some third examiner look at him once in awhile; is that correct?

General BYRNES. That is what usually happens, although what I had in mind, I had in mind supervision of the whole examining procedure, together with the examinaton that is submitted.

Senator MONRONEY. Senator Payne?

Senator PAYNE. No further questions.

Senator MONRONEY. General, we thank you very much. Do you have anything further to add?

General BYRNES. I don't think of anything further, sir.

Senator MONRONEY. We thank you very much for your courtesy in coming to help us out.

General BYRNES. Are you through with me?

Senator MONRONEY. Yes.

General BYRNES. Then I will leave.

Senator MONRONEY. We have next Capt. Ashton Graybiel, Director of Research, Naval School of Aviation Medicine.

Would you come forward, please?

We are very happy to have you. Would you state your name for the record?

STATEMENT OF CAPT. ASHTON GRAYBIEL (MC), USN, DIRECTOR OF RESEARCH, NAVAL SCHOOL OF AVIATION MEDICINE

Senator MONRONEY. Do you have a statement?

Captain GRAYBIEL. I have a few remarks.

Senator MONRONEY. Proceed in your own way. We are trying to learn all we can about this aviation medicine. None of us are doctors; we need all the help we can get.

Captain GRAYBIEL. I come here under substantially the same auspices as General Byrnes, who preceeded me, and with the sole purpose of trying to be helpful in any way possible.

I think one point which might bear reemphasis, or further emphasis, has to do with the business of flight safety. I think that it is generally agreed that the human element is probably more important than mechanical failure, with respect to aircraft accidents.

It is a very difficult thing oftentimes to be sure just what sort of an error was responsible for this accident. Even if the pilot should survive, it might be difficult, on reexamination, to determine that he had any pathological defect which was responsible for getting him into this difficulty when indeed such a defect did exist.

If this were a fatal accident, and you were to carry out a post mortem examination, here, too, different disturbances might have been the ultimate reason for the disaster, and yet your pathological findings might not reveal this.

I do think and feel very strongly that the present effort made by the Armed Forces Pathological Institute to carry out careful examinations on pilots who have had fatal accidents furnishes much important information, but I still think that there may be functional pathological disturbances which will not show up in the autopsy room.

Moreover, I think that it is perfectly possible for errors in judgment, let us say, to be due not alone to lack of professional skill but to some temporary physiological or psychological disturbance of the moment. And I think that all of this combined makes it extremely difficult to pin down and say exactly what we mean when a human error was involved.

Senator MONRONEY. You can have human error without anything pathologically wrong. A man might have been distracted by light or noise, or something like that, or coming in on instruments he may find that he wasn't getting the right report from his copilot or something.

All those things would have no relationship or would not show up in any way on the physical examination. We can't cure it all with medicine.

Captain GRAYBIEL. That's right. We feel that there is a relationship between the state of physical fitness of the pilot and his efficiency. For this reason we have physical standards which have been set up. These have been set up by medical people. And in my opinion, physicians with their background and training, and who have become specialists in aviation medicine, I feel that they are peculiarly well qualified to set up such physical standards.

I think all of us would admit very quickly that these standards are in need of continuous revision. Certainly, meetings are held periodically for the revision of these standards. Also, I think that

we would feel that it is very difficult sometimes to even carry out examinations with sufficiently reliable tools and with sufficient care to always come up with the same answer dealing with the same person, indicating a lack of reliability in the overall examination of the flyer in terms of a particular physical standard.

After all, the individual changes to some extent from time to time. There is a subjective component on the part of the physician in these examinations. And, also, we are actually in need of better tools than we now have.

Then there is also the problem of validating these standards, that is to say, whether or not they really are serving the purpose which we think they are. This is an extremely difficult matter. Even if we were able to control all of the factors involved, and if our expectations were always fixed, this would be difficult. But, where, as is true in aviation, the thing is of a dynamic sort and conditions are changing, this becomes very difficult indeed.

I think it is a good thing to compile all of this information, preferably put it, let's say, on punchcards, and as a result of analyzing these data, then draw up your new physical standards and shore up your weak points.

In other words, this would act almost like a feedback mechanism. You are putting in certain raw data, you are analyzing your results, you are trying to make corrections in terms of difficulties and soft spots which appear. So it would seem to me that any reasonable program of this sort is in the direction of increasing flight safety.

Senator MONRONEY. Do you have any age limits on your fliers in the Navy, as to certain types of equipment?

Captain GRAYBIEL. We have certain age limits for different categories of fliers. We call them in group 1 up to the age of 50, if they are able to meet all of the physical standards. Thereafter, they are automatically put into group 2.

Senator MONRONEY. Part of that would be because of combat effectiveness?

Captain GRAYBIEL. Yes, sir.

Senator MONRONEY. It would not necessarily mean that they are too old to do transport work, or other things, but just for the ease of classification you have the division?

Captain GRAYBIEL. Yes, sir. In general, the high-performance aircraft are flown by relatively young persons, and then as they grow older they get into command and administrative positions and they don't do that kind of flying any more.

Senator MONRONEY. How often are your pilots examined?

Captain GRAYBIEL. We examine them once a year.

Senator MONRONEY. Once a year?

Captain GRAYBIEL. Except for some special reason. If they have been ill, illness of any sort, particularly where they have been hospitalized, at the time of promotion, and for—I think those are the two things that medically come to mind as a reason for X-ray examination. Also change of duty, that is another one.

Senator MONRONEY. Is there any special examination or X-ray examination when a man is assigned to a real hot jet aircraft, from just an ordinary prop-driven machine?

Captain GRAYBIEL. These people are usually under very close surveillance. And while we still work within the limits of our class 1

physical standards, yet these people are watched very carefully and almost continuously by a flight surgeon. He has considerable leeway in judging or coming up with an opinion as to whether they are safe.

Senator MONRONEY. Do you mean they are watched in flight, or in the performance in the air, or by frequent visits to the surgeon's office, or how?

Captain GRAYBIEL. The flight surgeon would be assigned to a squadron or to a small group, and he would become very well acquainted with these men. And he would learn something about their habits and how they are getting along, the social aspects as well as the medical aspects of their lives. He would listen to their complaints and he would have a very good notion, I would say, on the basis of his experience and repeated dealings with these people, as to whether or not they are able to do this sort of work.

Senator MONRONEY. And he would report that as a part of his medical findings; would he?

Captain GRAYBIEL. I don't believe that he would as a formal thing. Capt. Langdon Newman is here. He might be able to answer that.

Senator MONRONEY. Maybe, in consultation with the commanding officer of the base, he could transmit his ideas of whether this man's reflexes are fast enough, or whether he is stable enough to be a jet pilot. Is that about what you mean?

Captain GRAYBIEL. No, sir. What I really mean is that, if these people pass the examination for grade 1, then if they are in a particularly hot spot they would be watched over very carefully.

I would say the main reasons why they might not be able to go on with it would be such things as difficulties outside of flying—coughs, colds, minor ailments, things of this sort which wouldn't interfere, let's say, with certain flying, but would in high-performance flying.

Senator PAYNE. If the flight surgeon noted in his contacts with the man, based on certain observations, he might suggest, "Why don't you drop down to the office so I can talk it over with you."

Captain GRAYBIEL. Yes, sir.

Senator MONRONEY. And then he might draw out the fact that he should give him a check on some particular thing to see whether or not he is on anything?

Captain GRAYBIEL. He does it on a very close personal basis.

Senator MONRONEY. How many medical-research facilities do you have looking into this problem? You don't run jointly with the Air Force do you? They are separate operations?

Captain GRAYBIEL. We have separate facilities. We have a School of Aviation Medicine in Pensacola, an acceleration laboratory at Johnsville, an air crew equipment laboratory in Philadelphia, a flight-test laboratory at Patuxent, and then we carry on certain aviation medical research projects at the large Naval Medical Research Institute at Bethesda.

Senator MONRONEY. You don't use many universities, as the Air Force does?

Captain GRAYBIEL. We have quite a few projects in universities.

Senator MONRONEY. Dealing with aviation medicine?

Captain GRAYBIEL. Yes, sir. All of our noise problems and acoustic problems, or a good deal of this anyhow, is handled by university contract. We have it on the fields of psychology, biochemistry. Indeed

I would say that there is probably not a major area that we are working on that is unsupported by some university department somewhere. We like to have them, at least, there to help and advise us.

Senator MONRONEY. And you are doing a lot of work on the noise feature? You can deafen a man almost, can't you, if he is working around a jet when it warms up?

Captain GRAYBIEL. Yes, sir. This is a very real problem, particularly aboard carriers, where the flight crews are so close to the jet planes.

Senator MONRONEY. You are trying to find guards to prevent that?

Captain GRAYBIEL. Yes, sir.

Senator MONRONEY. You mentioned the psychological factors. What are they?

Captain GRAYBIEL. Well, this extends almost all the way through aviation in the Navy. For example, we rely on psychologists very heavily in terms of our initial selection of flight candidates. By giving certain types of tests they have learned that they can predict to some degree as to whether or not they will be successful in flight training. They are useful in pointing out ways in which these pilots should be taught, or how they might best be graded. And then later on we are interested in the placement of certain pilots, probably who have either certain skills or certain desires to go in one direction as against another.

And we also feel that in the area of flight safety, in motivation, morale, leadership, all of these areas, the paramedical sciences, psychologists in particular, are very useful and helpful.

Senator PAYNE. I was amazed at the degree of accuracy with which flight surgeons and psychologists worked together in screening out—during World War II—and putting the men in their rightful classes. It was amazing how the thing worked out in the long run. One thing that amazed me in particular was—I remember one particular case that I happened to talk with Colonel Lee about at the time; there was a lad that I happened to know who had a pretty good record of experience as a pilot, a private pilot, and he was fired to be a pilot. Strangely enough, when he got through over there, the classification center said he was washed out as a pilot prospect but put in as a bombardier. I talked with Colonel Lee afterward, having known the lad, and the psychologist, one of the men in there, and they gave me very definite reasons why he was all right on normal civilian work, private plane work, but there were certain tests that he just couldn't measure up to, and they felt it was too much of a chance, but he would fit into the slot of a bombardier, so off he went.

So it does work into a pretty good pattern.

Captain GRAYBIEL. It certainly is extremely helpful and effects a great saving in manpower in carrying out these preliminary tests on them.

Senator MONRONEY. Will not the supersonic aircraft and the higher altitudes, and the lack of any visual contacts at the high altitudes—I understand there is almost a space blindness that comes on a pilot above 50,000 feet—wouldn't that present a whole new realm of problems for aviation medicine?

Captain GRAYBIEL. It does, Senator. We feel that we have tremendous problems with which we are faced as we go higher into, if not

space—sometimes they use the words "space equivalent." Many of these actually have not been solved. Many of them will have to be solved in collaboration with airframe manufacturers and the people who are responsible for the equipment in the plane, and things of this sort. But this is true. We have to—if not to set new physical standards in this regard, we have to be sure that these people are able to cary out their mission under these new environmental conditions. There is such a thing as space myopia. These people do have strange feelings at extremely high altitude. They feel sometimes as if they were remote from the earth. All together they pose, I would say, first-class problems to us.

Senator MONRONEY. Distance perception becomes almost impossible, doesn't it, unless you have something to guide it by, and particularly in approaching another aircraft closing at 500 miles an hour. If his speed is 500 and yours is also, there is a thousand miles an hour in closing.

Captain GRAYBIEL. They will have to have a supplement to vision.

Senator MONRONEY. We certainly appreciate your help. If there is anything else that you might have with regard to some of these problems, or if you would care to submit it later, we would appreciate it.

Captain GRAYBIEL. Thank you.

Senator MONRONEY. Mr. MacCracken is here. I believe we can hear him before we have to quit for lunch. Will you come forward, Mr. MacCracken?

We appreciate very much you coming out here to give us the benefit of your views. We know your record as the first Civil Administrator for Aeronautics; wasn't it? Assistant Secretary of Commerce?

STATEMENT OF WILLIAM P. MacCRACKEN

Mr. MACCRACKEN. Assistant Secretary of Commerce for Aeronautics; 1926.

Senator MONRONEY. And that put us on the road on the development of civil aeronautics, and many of the things that you instituted then are still, I believe, in the law today; are they not?

Mr. MACCRACKEN. Apparently the physical standards haven't been changed too much from what Dr. Bauer recommended and I approved.

Incidentally, speaking of Dr. Bauer, I think he founded the Army School of Aviation Medicine before he became our Director—the Medical Director we called it in those days—in the Department of Commerce in 1926. He was the first president, I believe, of the Aero Medical Association and afterward president of the American Medical Association.

He is in private practice now on Long Island, and a very able fellow.

It was my good fortune to persuade him to come into the Department of Commerce, and I have forgotten how many years he stayed there. I know he was there when I left. I was there a little over 3 years.

Senator MONRONEY. You recognized at the very start that aviation medicine was an important and very integral part of the safety of

flying, and that, therefore, you picked out the best man, the best experienced man, you could in that field.

Mr. MacCracken. Yes. My contact with medicine goes back some 68 years, as both my parents were physicians.

Senator Payne. You are not telling me that you remember back 68 years?

Mr. MacCracken. No; I don't remember back that far, Senator, but I say that is where it started. Almost 68 or 69 years ago.

My aviation experience started in 1917. That is 40 years ago, almost. in World War I, when I was a pilot. My first problems with visual qualifications came as a "guardhouse lawyer," when I was defending a pilot who had color blindness. It showed up when he was on night flying down at Ellington Field. That was the only place, I think, in this country where they had night flying.

We didn't have two-way communications from the ground to the plane. We had radio that we could signal the ground with, but we had no receiving sets in the planes in those days, and when they wanted to signal us at night they had to do it with red and green lights. And on night flying he couldn't get the signals straight. The question was whether he had been guilty of some unethical practices in passing his physical examination on color blindness, because, of course, we all had to go through that. I cross-examined for better than a half hour, I guess, each one of the medical men who appeared to testify about color blindness, and I think it is safe to say that I got the same answer to each of the questions—"I don't know."

And only a few months ago, I guess it is now, I was talking with 2 opthomologists who had been in the Army, 1 still on active duty and the other retired, and I happened to recall this incident, and they laughed and said, "Well, in the years that have elapsed, I think you would probably get the same answer to most of those questions." So there is still a lot to be done in that field.

There is no question but that physical standards, physical fitness, the construction of the plane to protect the passengers as much as possible, are very important factors in the safety of civil aviation. Of course, they are always important factors in military, but the factors in the two are quite different at various stages. Some of the basic factors are the same, but when it comes to the parting of the ways, as it is where the primary thing in civil aviation is to get there safely, the primary thing in the armed services is to accomplish your mission. And the mission sometimes involves hazards that a civilian pilot ought not to take.

What I am here for this morning is to stress the importance of vision in connection with air safety, and the part that the optometrist can play in bringing that about.

I know when we started these physical standards Dr. Bauer went around the country interviewing the men before they were designated to act as physical examiners. We sort of had to recruit them. Back in 1926 there weren't very many physicians or optometrists, either, who thought that there was a great future to aviation from the civilian point of view—civil aviation. And they were much more interested in prescribing diets for children and dealing with those problems than they were with the physical standards for pilots.

He found it necessary, and I think it was a good practice and still would be, to have some of these men work in teams, because the man

who is particularly competent to examine the heart, the nervous system, and other parts of the human body, may not be the man who is best qualified to pass upon the visual requirements.

I was interested in what General Byrnes said about the Snellen chart with the large letters and the flyspecks. 20–20 vision, which we hear so much about, is not very important in and of itself as far as the pilot is concerned, because there is very little that it is important for him to see at 20 feet. He has to see it either before 20 feet or he has got to see it at much closer distance.

When I started flying our instrument boards were not very important. You could never rely on the compass being accurate; the tachometer might be accurate; and the clock was almost always out of time, and the only thing that you really watched was your oil-pressure gage. When that went down you were in trouble.

Senator MONRONEY. And maybe gasoline.

Mr. MACCRACKEN. You knew about what that was. If they filled up your tank—and you very seldom stayed up long enough to run out of gas unless you were on a long cross-country flight, and we didn't make many of those. But those that had oil pressure, when that went down you went down too. If you were going to get there safely you started to look for a field.

Today I am sure both of you gentlemen have seen the inside of a cockpit. You know what it is. It is a very complicated thing. There are all sorts of instruments. The man has to see them under all sorts of lighting conditions. You get into clouds and one thing or another, and the visual problems in connection with both civil and military aviation are multitudiness, literally. There is no limit to them. And very little had been done in that field.

There has been some work done by the optometrist. I never had the pleasure of meeting Dr. Ashe, but I listened to him with a good deal of interest this morning, because he is at Ohio State University where they have a very fine optometry school, of which Dr. Glenn Frye is the head.

I hope that those two gentleman will get together and help to solve some of these problems in research that pertains to aviation.

The Civil Aeronautics Administration as it is now known, the CAA, theoretically will permit at the present time optometrists and physicians to work together in certifying pilots class 1, 2, or 3, but as a practical proposition they don't do it. The last communication that I had on that subject happened to come from Oklahoma, where this optometrist had had an applicant for a civilian pilot's license under his care, and yet the medical examiner was not willing to accept his findings and said that they had to be certified by an M. D.—a physician.

One of the suggestions that I would like to make with reference to amendments to this bill would be that you cut out the word "medicine." It has very little to do, as a matter of fact, with the physical fitness of pilots. They don't give them medication to make them physically fit except when they have a cold or something like that.

There are physical standards. And the physical standards are the important things.

It is true that physicians are the ones, the only ones qualified to pass on some of the physical standards. But it is also true that there are other groups such as the group that I represent—I represent the

American Optometry Association here in Washington—and the psychologists, who can make their contribution to the determination of the physical fitness of your pilots, and if you put all the stress on the word "medicine," immediately they turn it around and interpret it to mean "if you are not an M. D., if you are not a medic, then we are not interested in what you say or what you do or getting you into the program."

That isn't true of all of them, but it is true of a great many of them. Therefore, for that reason, I would suggest that if the committee is going to report out this bill, they go through it carefully—have the staff do it rather—and wherever the word "medicine" appears, put in either "physical standard" or "physical fitness" and leave the field open so that anybody who is able to make a contribution to determining what are the best physical factors, whether it is in the field of vision, which certainly is important, or in the field of psychology, or anything else, they won't be shut out simply because they don't have an M. D. degree.

As I say, I think I have evidenced the fact that I personally have great admiration for the medical profession, and I like to work with them. But I have also found that when it comes to dealing with optometrists in particular, but also with other groups allied to the care of the human body in determining its functions and its capabilities, that there are some of them who are very narrow minded. And therefore I believe that it is important that in legislation of this kind the wording be such that they will know that the legislature intended not simply to limit it to a man who has got a medical degree, because—and I think General Byrnes was the one who pointed out—just a medical degree doesn't qualify them in aeromedicine.

There are these visual problems, and there are psychological problems and other problems that affect the pilots. If you are going to pass this legislation, let's make it broad enough so that these other fields, or disciplines I believe is the word they like to use now, these other disciplines——

Senator MONRONEY. Other what?

Mr. MCCRACKEN. Disciplines, they call it. It is a field of activity, or they sometimes refer to it as a discipline—will be included in the work, the research, the advisory council, and also function as designated examiners, because there are many very competent optometrists who are perfectly capable of giving the complete eye examination and a much better examination and a much better certification than the average M. D. is equipped to give.

To bear that out, I would like to state that for over 10 years or more a man has not been able to get an original license to practice optometry in any one of the States or the District of Columbia without having had at least 3 years at the college level in his specialty. It was 1 year for a while and now it is 2 years of preoptometry, and 3 years in that specialty dealing with vision. Certainly the men that have had that type of training and the others who didn't get that training in educational institutions but who have been practicing for a long time, who have had the experience, are qualified to do this particular work which, as I say, I am sure everybody recognizes is important in aviation as it is today, and more important as it is going to be 2 or 3 years from now.

Senator MONRONEY. Senator Payne?

Senator PAYNE. I have no questions.

Senator MONRONEY. Thank you very, very much for coming up and seeing us.

Mr. MACCRACKEN. I appreciate very much your giving me this opportunity to talk off the cuff.

Senator MONRONEY. Mr. MacCracken, we know the interest that you have always had in aviation and the foundation that you have put under the civil aviation regulations which started us out in the right way. We are grateful to you for coming up.

Mr. MACCRACKEN. I am very grateful for the fact that I had some very good men, and one of the best was Dr. Louis Bauer. I don't want anybody to think that I don't appreciate that.

Senator MONRONEY. The committee will have to stand in recess until about 2:30, at which time we will try to take some of the other witnesses that have asked to be heard, in order to let them get back to their various jobs.

We will stand in recess at this time.

(Thereupon, at 12:45 p. m., the committee was adjourned, to reconvene at 2:30 p. m., this day.)

AFTERNOON SESSION

Present: Senators Monroney (presiding) and Schoeppel.

Senator MONRONEY. The Subcommittee on Aviation of the Interstate and Foreign Commerce Committee will resume its sitting.

We would like to hear from Mr. Lawrence L. Gourley, legal counsel, American Osteopathic Association.

Will you come forward and proceed in your own way, Mr. Gourley.

STATEMENT OF LAWRENCE L. GOURLEY, LEGAL COUNSEL, AMERICAN OSTEOPATHIC ASSOCIATION

Mr. GOURLEY. Thank you. My name is Lawrence L. Gourley; I live in Washington; I am legal counsel for the American Osteopathic Association and appear on behalf of that association.

We very much appreciate the privilege of making this appearance, Mr. Chairman.

The association is a federation of State societies; its membership comprises physicians legally licensed and practicing in all of the States who are graduates of approved colleges of osteopathy and surgery; an approved college requires a minimum of 3 years' preprofessional college work for entrance and 4 years of professional college work for graduation. Most graduates intern for 1 or 2 years in hospitals approved for intern training, and many take residency training of 2 or more years in hospitals approved for residency training.

The primary objective of the association is promotion of the public health. Manifestly, it is interested in the progress of aviation medicine and its relationship to the Civil Aeronautics Administration.

In order to provide adequately for safety in air commerce, sections 601 and 602 of the Civil Aeronautics Act devolve upon the Civil Aeronautics Board and the Administrator of Civil Aeronautics, the power and duty to prescribe rules, regulations, and standards, after

taking into account any differences between air transportation and other air commerce, and to issue airman certificates containing such terms, conditions, and limitations as to duration, periodic or special examinations, tests of physical fitness, and other matters as the Administrator may determine to be necessary.

Current regulations require that the medical examination be made for airline transport pilot by a "designated airline medical examiner," for commercial airman by a "designated medical examiner," and for student and private pilot by a "competent, licensed physician."

It will be observed that the regulations require medical examinations by designated medical examiners in some cases and by any competent, licensed physician in other cases. Neither the act nor the regulations define the terms designated medical examiner or competent, licensed physician.

Licensed osteopathic physicians have served the Civil Aeronautics Administration in both categories.

The pending bill, S. 1045, also provides 2 categories of medical examiners, but on page 3 prescribes the degree of doctor of medicine as a basic qualification for both categories.

This would prevent the Administrator from utilizing members of the osteopathic profession.

We propose to show that such a restriction is unrealistic, wasteful, and inconsonant with other Federal legislation.

Two years ago an investigating committee weighted with deans of medical schools visited the osteopathic colleges and found that they impart sound medical education (AMA Journal of July 2, 1955).

In legislating for the District of Columbia, in 1929, Congress prescribed:

> The degrees of doctor of medicine and doctor of osteopathy shall be accorded the same rights and privileges under governmental regulations (45 Stat. 1329).

Osteopathic physicians are eligible and serve in the Department of Medicine and Surgery of the Veterans' Administration. The law prescribes that to be eligible for appointment in the medical service the applicant must—

> hold the degree of doctor of medicine or of doctor of osteopathy from a college or university approved by the Administrator, have completed an internship satisfactory to the Administrator, and be licensed to practice medicine, surgery, or osteopathy in one of the States or Territories of the United States or in the District of Columbia (59 Stat. 676).

All six osteopathic colleges are approved by the Administrator of Veterans Affairs and all intern-training hospitals approved by the American Osteopathic Association are approved by the Administrator. There are no unapproved osteopathic colleges. Osteopathic physicians serve also as VA designated fee-basis physicians for purposes of physical examinations and treatment. That is for the hometown program.

Osteopathic physicians are expressly eligible for appointment in the Medical Corps of the Army and Navy and for service as medical officers in the Air Force (70 Stat. 608). This authority was implemented by Department of Defense on October 24, 1956. Doctors of osteopathy are, therefore, legally eligible to qualify as medical ex-

aminers as medical officers in the Air Force. All colleges qualify under the implementation of the Department of Defense.

Civil service preliminary physical examinations "may be executed by any duly licensed physician (doctor of medicine or osteopathy)." Federal Personnel Manual (60 Stat. 903).

Doctors of osteopathy are legally qualified to examine physically and to certify drivers of interstate motor carriers. Sections 191.8, 191.9, and 191.10 of Interstate Commerce Commission regulations, relating to original physical examination of drivers, periodic physical examination of drivers, certification of physical examination, respectively, require physical examinations and certifications "by a licensed doctor of medicine or osteopathy."

Safety Regulation Instruction No. 206 issued by the Civil Aeronautics Administration on September 4, 1945, prepared by General Inspection Division and Aviation Medical Division interpreted the term "competent, licensed physician" as follows:

> Some question has arisen with regard to the interpretation of a "competent, licensed physician" who may conduct the subject examination.
>
> Form A. C. A. 1945, Report of Physical Examination for Student and Private Pilots, has heretofore stipulated that application for the examination be made to any licensed physician (M. D.) in active practice. Inasmuch as there appear to be physicians other than M. D.'s who are properly licensed, equipped, and fully capable of conducting this examination, the Form A. C. A. 1345 has been revised, deleting reference to M. D.
>
> Inspectors may therefore accept a medical certificate from an applicant where such certificate has been executed by any doctor of medicine or doctor of osteopathy licensed to practice under the laws of the State involved.

In view of the foregoing, we urge this bill, S. 1045, be amended so as to make the degree of doctor of osteopathy an acceptable basic qualification for a medical examiner.

Although most of the powers provided in S. 1045, are already vested in the Civil Aeronautics Board and the Administrator, we believe that some such legislation would serve to provide and sustain needed emphasis to the important field of aviation medicine.

Senator MONRONEY. Thank you very much, Mr. Gourley for your statement.

You are referring on page 3, to section (f):

> "Medical examiner" means any licensed physician who holds the degree of doctor of medicine, * * *

Mr. GOURLEY. That is right.

Senator MONRONEY. And—

> * * * and who is authorized by the Administrator to perform physical and mental examinations of airmen who are required by civil air regulations of the Civil Aeronautics Board to hold medical certificates.

Mr. GOURLEY. That is right.

Senator MONRONEY. And that is what you would like to have amended?

Mr. GOURLEY. We would like the bill amended in order to have the degree of doctor of osteopathy an acceptable basic qualification.

Senator MONRONEY. If you have a basic law in the State that permits the two to practice, the laws of the State permit them to practice——

Mr. GOURLEY. They are licensed in all the States.

Senator MONRONEY. So, if that would refer to those licensed in the State therein, that would meet your primary wish, would it?

Mr. GOURLEY. That would meet it provided—let me put it this way. The provision, the way it is now, requires the degree of doctor of medicine as the sine que non of acceptability.

Senator MONRONEY. Yes, sir.

Mr. GOURLEY. That is basic, that does not mean that he should not have to have further requirements so far as aviation medicine is concerned, as for certifying air transport pilots, for instance. We are requesting that the degree of doctor of osteopathy is also acceptable as a basic qualification.

Senator MONRONEY. I see. One for the other you mean?

Mr. GOURLEY. The same as the degree of doctor of medicine. In other words, acceptable on an equal basis so far as basic qualification is concerned.

I may say as a matter of further demonstrated genuine interest in aviation medicine on the part of the osteopathic profession that a considerable number are serving as flight surgeons and medical officers of the Civil Air Patrol which is an official auxiliary of the Air Force and doing a good job.

Senator MONRONEY. You mentioned also that they are serving as medical officers and examiners in the Air Force.

Mr. GOURLEY. I say they are legally qualified to do so.

You just passed a law last July making them eligible. The Department of Defense has implemented it; the Air Force has not yet done it, but we think they will.

Senator MONRONEY. I misinterpreted, legally eligible.

Mr. GOURLEY. Under the law they are legally eligible, and by going in as medical officers and by taking the regular required 9-week primary course they would qualify along with other medical officers as medical examiners in the Air Force. I understand that is the basic qualification for air examiner.

Senator MONRONEY. We thank you very much, Mr. Gourley, for your statement.

Mr. GOURLEY. Thank you, sir.

Senator MONRONEY. Is Mr. Oscar Bakke here?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Will you come forward.

STATEMENT OF OSCAR BAKKE, DIRECTOR OF THE BUREAU OF SAFETY, CIVIL AERONAUTICS BOARD, ACCOMPANIED BY ROSS I. NEWMAN, CHIEF, INTERNATIONAL RULES DIVISION, CIVIL AERONAUTICS BOARD

Mr. BAKKE. Mr. Chairman, my name is Oscar Bakke, of the Civil Aeronautics Board, and I have with me Mr. Ross Newman, of the General Counsel's Office of the Civil Aeronautics Board.

Senator MONRONEY. We are very glad to have you with us, and we are delighted to have your testimony.

You may proceed in your own way.

Mr. BAKKE. Mr. Chairman and members of the committee, my name is Oscar Bakke, and I am Director of the Bureau of Safety of the Civil Aeronautics Board.

The purpose of the legislation is to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation, consistently with the declaration of policy in section 2 of the Civil Aeronautics Act of 1938, as amended. The Board has made a careful study and review of the bill and appreciates the opportunity of submitting its comments thereon.

The bill is in the form of an amendment to the Civil Aeronautics Act, and would add a new title XIV, Civil Aviation Medicine. Under this title there would be established in the Civil Aeronautics Administration an Office of Civil Aviation Medicine, composed of civil air surgeons, regional flight surgeons, and a Civil Aeronautics Medical Research Laboratory. This Office would be headed by a civil air surgeon.

The Civil Air Surgeon would be authorized to promulgate regulations establishing minimum standards of mental and physical fitness for civil airmen; establishing minimum human requirements in aircraft design; providing for medical examinations of civil airmen; providing for the issuance of medical certificates to civil airmen and for the amendment, suspension, or revocation of such certificates; for the inspection of aircraft and aircraft components and appliances in order to meet the human requirements in aircraft design and operation; and finally, for the inspection and appraisal of medical examiner facilities.

The Civil Air Surgeon would be authorized to conduct and encourage research and investigation in the field of aviation medicine. In this connection he would be authorized to collect information as to such research; collect pertinent data concerning medical aspects of accidents in air commerce, physical condition of airmen, and such other subjects as may provide guidance in establishing sound medical regulations; establish research fellowships in the Office of Civil Aviation; provide postgraduate training courses in civil aviation medicine; participate in the investigation of civil aircraft accidents, and where indicated, require physical examination or autopsy of passengers and crew involved; and adopt, upon recommendation of the Federal Advisory Council on Civil Aviation, such additional means as he deems appropriate to carry out these functions.

The Civil Air Surgeon would be empowered to make grants-in-aid to universities, hospitals, laboratories, and other public or private institutions and to individuals for such research projects as are recommended by the Council.

The Civil Air Surgeon would be directed to publish information related to civil aviation medicine.

It is provided that nothing in section 601 of the Civil Aeronautics Act shall authorize the Civil Aeronautics Board to prescribe any standards, rules, or regulations with respect to any matters included within the scope of the powers and functions granted to the Civil Air Surgeon.

This bill provides that in time of war or emergency the President would be authorized to utilize the Office of Civil Aviation medicine in such manner as, in his judgment, will promote the public interest.

The bill would establish a Federal Advisory Council on Civil Aviation Medicine consisting of 17 members, 5 of whom would be designated from Government departments, and 12 of whom would not be in

the Federal employ. The Council would consult with the Civil Air Surgeon.

The Civil Air Surgeon would be authorized to employ special consultants to assist and advise the operations of the Office of Civil Aviation Medicine.

The bill would authorize the appropriation of $2,500,000 for the erection and equipment of buildings and facilities for use of the Civil Aeronautics Medical Research Laboratory.

The Administrator of Civil Aeronautics would be authorized, upon request of the head of an executive department, to detail employees of the Office of Civil Aviation Medicine to such department. The Civil Air Surgeon would be authorized, upon the request of any State aviation authority, to detail employees of the Office to assist in work related to the functions of the Office, and also would be authorized to detail employees of the Office to nonprofit educational research or other institutions engaged in aviation medicine activities.

The bill also contains detailed provisions in regard to the acceptance of gifts for the benefit of civil aviation medicine.

It is obvious from the foregoing outline of the major provisions of the bill that the legislation proposed is of considerable magnitude and would effect important changes, both of substance and of organization.

While concurring in the broad objective of the bill to improve air safety insofar as medical and physical considerations are concerned, the Board believes that this objective can in general be better accomplished within the framework of existing law than under the provisions of the legislation proposed by S. 1045.

Before discussing the specific provisions of the bill I would like to comment briefly on these aspects of air safety as treated under existing provisions of the Civil Aeronautics Act.

The matter of the physical qualifications of pilots and other airmen has received careful attention from the Board and the Administrator of Civil Aeronautics in carrying out their respective safety responsibilities under the Civil Aeronautics Act. Regulations and procedures have been established by both agencies in their assigned fields, under which airmen are required to undergo periodic physical examinations and demonstrate their continued physical fitness.

The standards which must be met are set forth in part 29 of the Board's Civil Air Regulations. These regulations prescribe specific requirements as to visual acuity, depth perception, ear, nose, and throat equilibrium, and blood pressure, in addition to which the examination must show that there are no organic or structural defects which would interfere with the safe piloting of aircraft. The actual physical examinations of the airmen to determine whether they meet the standards set forth in the regulations are, of course, conducted by licensed physicians.

The administration of the program for examining airmen is the responsibility of the Administrator of Civil Aeronautics, and for this purpose he maintains a medical office and staff of doctors.

The physical condition of an individual is, however, only one of a number of factors that bear on his eligibility for certification as an airman. Experience has shown that there are some cases in which certain types of physical shortcomings can be fully compensated for,

insofar as air safety is concerned, by reason of the individual's above-average skill, experience, or characteristics in other respects. Accordingly, the Board's regulations provide that in appropriate cases an airman certificate may be issued to an airman even though he does not meet all the physical standards if his aeronautical experience, ability, and judgment compensate for his physical deficiency, and he meets all other requirements.

In the opinion of the Board, the existing procedures combine to form a balanced program, in which full weight is given to the requirements of physical capacity, but with sufficient flexibility to meet unusual situations and to promote the development of aviation in a practical manner.

Under the above-outlined procedures the safety record in air carrier transportation has been excellent. For instance, in 1938 the domestic scheduled airlines flew 1.4 million passengers 68.4 million plane-miles and 561 million passenger-miles. The passenger fatality rate per 100 million passenger-miles was 4.5. Eighteen years later—in 1956—the combined domestic and foreign/overseas scheduled passenger services involved approximately 45.6 million passengers, 811.3 million plane-miles, and 28.6 billion passenger-miles. The passenger fatality rate per 100 million passenger-miles flown in 1956 was 0.5, marking the fifth consecutive calendar year in which this rate was less than 1.

The large irregular or supplemental air carriers in 1956 conducted their public and military contract passenger operations without a single fatal or nonfatal accident in services that embraced approximately 1.1 billion passenger miles.

The Board does not mean to imply that there is not room for further improvement. In this connection the Board has undertaken to review the situation to determine whether better procedures for obtaining medical advice in relation to medical aspects of the rules and regulations can be devised. To the extent that changes appear to be desirable, it is expected that they can be accomplished by amendment of the Board's own regulations and within the framework of existing legislation, thus, while the Board concurs in the underlying objectives set forth in S. 1045 insofar as it is sought to assure to civil aviation the benefit of the best possible medical advice and attention, it believes that, insofar as present standards may fall short of that goal, improvement can be better achieved under the existing organizational arrangements than under the plan for amendment of the Civil Aeronautics Act set forth in the bill.

In this connection the Board desires to point out that if an increase in research activity in the field of aviation medicine is necessary, it is believed that this purpose can be accomplished by the Administrator more easily and less expensively by organizational means under present statutory authority than as proposed.

At present, aviation medical matters relating to Civil Aeronautics Administration functions are vested in the Medical Division of the Office of Flight Operations and Airworthiness. The new bill would have the effect of changing the Medical Division to an office on the same level as the Office of Flight Operations and Airworthiness. The Administrator could accomplish such reorganization administratively without additional legislation.

Under the "administration" section of the bill it is proposed to modify title VI of the Cvil Aeronautics Act so as to transfer from the Board to the Civil Air Surgeon the authority to establish "minimum standards of mental and physical fitness for civil airmen." Under this proposed arrangement, the Board would continue to establish all of the standards for airman certification except the physical standards. There is no doubt that this would have the effect of negating the present Board control over the establishment of adequate levels of safety in the certification of airmen, as the physical requirements established by the air surgeon could override all others.

Moreover, if the Civil Air Surgeon were given authority to promulgate standards and regulations, there is no guaranty that those who would be subjected to the new rules would be given the wide opportunity which is now afforded by the Board for them to have their objections heard with respect to regulations which might be unduly burdensome or detrimental.

Furthermore, it may be noted that the enactment of S. 1045 would result in a situation in which a professional group, having responsibility for the promulgation of regulations governing the frequency and possibly the cost of physical examinations, would be the sole recipients of the remunerative benefits therefrom.

The proposed modification of title VI of the Civil Aeronautics Act so as to transfer from the Board to the Civil Air Surgeon authority to establish minimum standards of mental and physical fitness for airmen cannot be justified on the basis of any record of aircraft accidents resulting from physical unfitness of airmen.

A study of United States air carrier accidents since 1951 was made by our Accident Analysis Division to determine whether physically unfit airmen have been piloting air carrier aircraft so as to endanger the flying public or persons and property on the ground. The results of this study reveal no significant basis to support a claim on this ground.

Statistics on non-air-carrier accidents were not as complete, but an analysis of available information similarly revealed no significant basis on which to predicate a finding that the physical condition of airmen contributed to these accidents.

In view of this record, the proposed amendment of the Civil Aeronautics Act to provide for a new title dealing with aviation medicine would appear to be placing too much emphasis on only one of a number of factors that bear on the eligibility of airmen for certification.

The bill proposes to establish a Federal Advisory Council on Civil Aviation Medicine consisting of 17 members, 12 of whom shall be appointed by the Civil Air Surgeon to hold office for 4 years. The function of the Council would be to advise, consult with, and make recommendations to the Civil Air Surgeon on aviation medical activities and functions of the Office of Aviation Medicine. In addition, the Civil Air Surgeon would be authorized to employ consultants to assist and advise in those matters mentioned above. Both the members of the Advisory Council and special consultants would be paid up to $50 per day and also be entitled to receive an allowance for actual and necessary traveling and subsistence expenses while serving away from their places of residence.

It would appear that the Director of the Medical Division of the Civil Aeronautics Administration now has at his disposal for advice

and consultation specialists in every conceivable aeromedical field. The Civil Aeronautics Administration medical staff has for many years taken an exceedingly active part in all of the professional associations concerned with aviation medicine, including the Aero-Medical Association and the Civil Aviation Medical Association. The effect of the proposal would seem to be to authorize the Civil Air Surgeon to pay these specialists for giving the advice and information which should now be available through association channels.

The research, investigation, and training provisions of the bill appear to have a worthy motive and should provide the answers to many questions that would help to provide realistic physical standards that will assure an adequate level of safety and yet permit the greatest number of people possible to engage in aviation pursuits. However, the Civil Aeronautics Administration's Office of Aviation Medicine has a research center at the Ohio State University where such research either is, or could be carried on.

It would appear to be far more economical to request an appropriation to continue and extend this program rather than to spend the large sums which would be required for the construction of new facilities. In this connection it is our understanding that for many years the Office of Naval Research has found it far more economical to outline the fields in which research is desired and to contract for the fulfillment of these research projects with private educational institutions.

With respect to the airworthiness phases of the proposed legislation, we note that the Civil Air Surgeon is authorized to promulgate regulations establishing minimum human requirements in aircraft design and also regulations for the inspection of aircraft, aircraft components, and appliances designed for use in air transportation in order to meet the human requirements in aircraft design and operation. It would appear that this regulatory authority would take the Civil Air Surgeon into branches of aviation which are far removed from the professional fields in which he had been trained. Inspections conducted under such authority could get involved with the design and manufacturing of new aircraft, the day-to-day functions involving the flight operations and maintenance of aircraft, including components and appliances and the investigation of accidents.

It appears to us that this would introduce considerable confusion, result in duplication of effort in many areas and lead to frequent disputes and clashes of interests in the promulgation of safety regulations and their implementation.

Many of the airworthiness requirements involve the human elements, that is, oxygen equipment, emergency exits, instrument panels, all aircraft and engine controls, flight characteristics, etc. Obviously, an airplane has to be operated by a human being and its functioning has to be within the limitations and capabilities of that human being. Consequently, the airworthiness requirements must take into consideration, in addition to the purely mechanical properties of the airplane, the human factor.

It is not possible to state the relative importance of mechanical characteristics versus the human characteristics in any design feature. We do know that the mechanical characteristics of any given design can be definitely proven and demonstrated but that human characteristics and capabilities are largely theoretical. Consequently, the grant

of authority in the proposed legislation could impose such theory-based limitations on aircraft design as to seriously affect its performance and economy and instead of having the beneficial effect intended could lead to actually retarding advancement in the art.

At the present time aeronautical engineers, and not medical people, design aircraft and are responsible for the technical aspects of Government regulations in this field. These aeronautical engineers, by education and experience, are taught to take into account the human factor in every phase of design. Where such human factor becomes of significant importance, aeronautical engineers consult medical people. History shows that the resultant product has in most cases been compatible with human factors. It is possible that this consultation has not in the past been as extensive or carried as far as it should have been, but we feel that one of the reasons for this is that the general lack of pertinent knowledge by the medical profession has not provided the design engineer with the most effective information. There is no reason to believe that the medical profession could contribute anything more toward improvement in aircraft design under the proposed regulations than they have in the past, unless such contributions were based on results obtained from a vigorous program of aviation medicine research and development. It thus appears that the only constructive element in the proposed legislation is the proposal to undertake and encourage research and investigation in the field of aviation medicine.

I repeat that in our opinion the Civil Aeronautics Act now provides sufficient legislation, through the powers granted to the Civil Aeronautics Board, to provide appropriate medical responsibility.

The philosophy inherent in the bill is that doctors should have a major, if not determinative, say as to who shall fly. The Board does not believe that it is sound to give any one group of experts the final say in the aviation safety field, where advancement is dependent not only on one profession but on several professions. If engineers were given the final say, airplanes might be somewhat safer, yet so expensive their operation would be impossible; if economists were alone in control, the airplane might be cheap but unsafe; and if the doctors have the final voice, there might be few who would qualify as airmen. Each of these groups should be heard by the body enacting the standard, and their expert advice considered, but the final decision should, we believe, be made by the agency having overall responsibility for the promotion of aviation development and safety.

For the foregoing reasons, the Board strongly opposes the enactment of S. 1045.

The Bureau of the Budget has advised that there is no objection to the submission of the foregoing statement.

Senator MONRONEY. Thank you very much, Mr. Bakke. I gather from following your statement rather carefully that the principal objection you have is that the bill is not needed to bring about the improvement in aviation medicine that perhaps is needed with the advent of supersonic-aviation speeds and high-altitude flying; that there is enough latitude in the present law which, if implemented by appropriations, could bring about the establishment of a better research program and better examination, more competent specialists in aeromedicine than we now have. Is that correct?

Mr. BAKKE. That is precisely the Board's view, sir.

Senator MONRONEY. And you can do it now without changing the various authorities that the bill as you point out seems to change in several places?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. One of these authorities that they seem to change is the fact that the Civil Air Surgeon under the bill would supersede the CAB in many of its duties in carrying out the air safety program.

Mr. BAKKE. Well, the one duty in particular, sir, the promulgation of physical standards for airmen.

Senator MONRONEY. You allow that to be done now by the CAA?

Mr. BAKKE. Not in the absolute sense, sir; which is contemplated by the proposed legislation. The Board does make very wide use of the authority which the Congress provided in the act for the delegation of the rulemaking function and the Board has, from time to time, in areas in which highly specialized or highly localized knowledge is required, where there is necessity to give close attention to particular cases under partcular sets of circumstances, has delegated to the Administrator the power to act with his own discretion, we do this very broadly in part 29. The Administrator is, for instance, given authority to waive the provisions of the Civil Air Regulations when, in hs judgment, the individual possesses certain characteristics or qualities which tend to compensate for a given physical deficiency.

Now, this delegation is a rather broad one, sir, and under this delegation the Administrator has seen fit to supplement many of the Civil Air Regulations but always the Board is the final authority. Appeal may be made to the Board.

This delegation of rulemaking responsibility may be supplemented by the Board at any time by the promulgation of specific requirements which would affect that exercise of discretion.

Senator MONRONEY. On the design features which you speak of at some length, you apparently feel that this definitely is something over which we cannot give overwhelming authority to the medical side or to the Civil Air Surgeon, is that correct?

Mr. BAKKE. Yes. This is clearly the case, sir.

Senator MONRONEY. I would like to have you tell us more about that. In other words, today the airworthiness certification comes about by the CAA, does it not?

Mr. BAKKE. The physical act of certification does, sir, but the certification by the Administrator is an act of certifying that an airplane has met the airworthiness standards promulgated by the Civil Aeronautics Board.

Senator MONRONEY. I see.

I wish you would tell us a little bit more about that as to how this would result, from your testimony, at least, in transferring some power from the rights of the CAA administering the CAB laws to determine the airworthiness of the plane.

Mr. BAKKE. Well, sir, I might use as an illustration, for instance, some of the standards which exist in the regulations at the present moment concerning the cockpit configuration.

There are certain regulations which govern the ability of a pilot to see outside the airplane, through the windshield. There are other

regulations which govern the ability of a pilot to read his instruments which would appear, of course, directly in front of them and to actuate certain controls which are also in front of him.

Now, how the instrument panel, the configuration of instruments, the shape and size of the instrument panel, the size, shape, and location of controls are to be designed in any particular instances, of course, is a compromise between many, many conflicting requirements.

There are times when we would like to see all of the front of an airplane, a windshield so that we might see and avoid other traffic; however, to do a reasonably competent job of instrument flying we need all of the instrument panel that we can possibly make available to the pilot.

These two objectives conflict and a compromise must result.

Now, if we have specialists in each particular phase write their own specific requirements for the design of aircraft, obviously the instrument people would make the front end look like an instrument panel; the windshield people would make the front end all windshield. This is the sense in which we suggest that if we gave the Civil Air Surgeon independent authority to determine certain design characteristics of an aircraft, obviously he would tend to make that design suit the objectives of this particular office.

This cannot be done by a single group. The aeromedical information must be thrown into the basket along with the many other requirements on the basis of which aircraft design is guaranteed and this can only be done by giving a single agency the responsibility for the promulgation of standards.

Senator MONRONEY. As the bill is written, would you interpret then that it says that the Civil Air Surgeon would have more to say about the approval of aircraft than would the Administrator for the Civil Aeronautics Administration?

Mr. BAKKE. No, sir, I would say that the Civil Air Surgeon would be able to provide the Administrator in the aircraft certification process with standards which might very well be in conflict and in many instances I would suppose in substantial conflict with standards which the Board would have given the Administrator.

Senator MONRONEY. But then he would be receiving standards from both the CAB and from the Civil Air Surgeon and then would have no way of resolving them.

Mr. BAKKE. Correct, sir.

Senator MONRONEY. In this bill as it is drafted according to your testimony he would be supreme in matters affecting the health requirements, the suitability of the plane for health and personal safety, would he not?

Mr. BAKKE. Yes, sir; he would. But the question as to whether a particular design, for instance, should satisfy a medical requirement or an airworthiness or engineering requirement raises the conflict of which I speak.

We would then have two authorities, one saying that a structural member in the forward part of the airplane shall not be more than 2 inches thick in order to insure binocular vision, in order to insure again that pilots may see and avoid another aircraft, and still another authority, an engineering authority, saying that that same structural member must not be less than 4 inches thick. I use that, of course,

as an illustration, but there is no provision made for the resolution of this type of conflict.

Senator MONRONEY. And you feel that human requirements in aircraft design would be entirely too broad, the health, the pressurization facilities and things of that kind?

Mr. BAKKE. Yes, sir. I think that all of this type of determination is merely a part of the task of determining the airworthiness of aircraft certification standards generally.

Senator MONRONEY. Pretty soon you are going to get into these jets, passenger transports which will be flying what, about 25,000 to 30,000?

Mr. BAKKE. I dare say a good deal higher than that, sir.

Senator MONRONEY. Higher than that.

Well then, would you say that the CAB through its requirements to the Civil Aeronautics Administrator would be able, properly, to outline, without some advice of medical personnel the pressurization needs? In other words, what would happen in the event that your single system maybe of pressurization would go out? I mean, if you are at 35,000 feet and your pressurization would go out you would probably have a very critical period of time immediately in the plane, would you not, in getting down to a livable level of atmosphere?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. I know you carry oxygen masks and oxygen tanks, but still it is quite a problem to get those distributed and get people to using them.

Mr. BAKKE. Yes, sir; I might answer your question generally. The question was whether we were prepared to provide certain requirements without the benefit of medical advice. I think the answer to that is "No; we are not." I think that the Administrative Procedure Act clearly contemplated that the Board, as with all regulatory agencies, should consult to the maximum extent practicable with the experts in any particular field in order to regulate properly.

I think clearly that the Administrative Procedure Act would, in the area of medical requirements, expect that the Board will consult regularly, frequently, with aviation medical experts in the development and promulgation of its regulations.

We need medical advice, clearly we do. As to whether a group of medical experts should have conclusive authority with respect to such matters as aircraft pressurization, I think here the results are almost frightening, sir. I think that experts in one particular field should clearly not be given authority, the exercise of which could in some respect be catastrophic. A requirement, for instance, to provide for pressurization which might actually jeopardize or compromise the airworthiness of the airplane could very likely result from this type of thing. It would appear to me——

Senator MONRONEY. How do you mean, "would result from that type of thing"?

Mr. BAKKE. One will probably recall the experience of at least one jet aircraft in which the pressurization facilities of the aircraft were actually instrumental in the catastrophic destruction of the aircraft under certain circumstances. I think it has been long recognized that even such systems as aircraft pressurization systems, unless they are used intelligently and with full knowledge of what their conse-

quences are, insofar as pressurization might compromise the structural integrity of the aircraft, that such a system could prove just as catastrophic in its effect as though we had planted a bomb in the airplane. Certainly the explosive decompression of the aircraft at high altitude of the type which has been experienced in at least one such case, I think, would fairly be called catastrophic.

It is for this reason, sir, that I would say that a kind of judicial judgment is required here, a weighing of the pros and cons of various conflicting requirements. And I do not think that this is the type of thing that one should be asked to coordinate between two separate agencies having their respective jurisdictions in parts of this field. This is something which it would appear to me a body having overall responsibility for the safety of aircraft operation should be called upon to promulgate in the case of rules and administer in the case of the certification process.

Senator MONRONEY. Now, I can well understand where you figure that the technicians, the people who must design these planes, put them together and all, would probably be more competent to deal with the needs and through your CAB and CAA to properly certificate them than perhaps the medical officer. But, you go quite strongly in your statement then saying that giving authority under the bill 1045 would give unusual discretionary power to the Civil Air Surgeon to say who could fly. He could not say who could fly, but he could only say people meeting "X" specifications could fly. Would not someone finally have to determine those minimum requirements and, as a matter of fact, are not they pretty well determined now by the head of the Bureau of Medicine in the CAA?

Mr. BAKKE. My answer to that would be no. Qualified as I attempted in part to qualify it just a few moments ago.

The standards are rather general in character, in some respects they are specific, but by and large they are rather general requirements in part 29. These have been promulgated by the Board, they are given to the head of the Office of Aviation Medicine who administers these rules; he certificates airmen or in this case issues medical certificates to those who have met the provisions of part 29. It is a two-part answer to your question, sir.

The Board provides the general standards but has given the Administrator rather wide latitude to develop additional requirements especially in the exercise of his waiver authority.

I might suggest, sir, that there is at least one other area in which the Board has at least effectively, at least practically, delegated discretion to the Administrator.

You will recall in 1 section, in 3 sections, as a matter of fact, each with respect to the first, second, and third class medical certificates, the Board has charged the Administrator or has prevented the Administrator from issuing medical certificates to persons who have certain defects. The language in the section is the broadest, it gives the Administrator considerable latitude to determine what is a defect in accordance with the regulations. In order to make this determination and in order to apply it with any degree of uniformity, he publishes for his own people a guide for medical examiners which contains a good deal of detail and which outlines specific diseases or specific deficiencies which are considered to be defects which would prevent the safe operation of an aircraft by a pilot, for instance.

Now, it is true that in carrying out his more detailed responsibilities under part 29 he has supplemented the regulations with a good many standards.

Senator MONRONEY. Do you feel the standards of medical fitness are up to date and strong enough in the present regulations?

Mr. BAKKE. Sir, we do not believe that they are up to date.

Senator MONRONEY. May I say, Senator Schoeppel, this morning it was testified that they are practically the same medical standards and requirements that came down to the CAA from the old Assistant Secretary of Commerce for Air. Is that not correct?

Mr. BAKKE. I believe that since 1942 when part 29 was originally adopted there have been a total of perhaps five substantive amendments to part 29. I would say that the majority of the substantive provisions of part 29 have been the same for about 15 years.

Senator MONRONEY. And the changes have been weakening rather than strengthening, I mean, liberalizing the physical requirements rather than strengthening and tightening them up; have they not?

Mr. BAKKE. Yes; I believe it would be correct to say that most of the changes which have been made have been in the direction of liberalizing the requirements.

I started to say, sir, if I might be permitted, that when you asked the question before as to whether we considered the present regulations up to date, my answer was "No." As of February 1956 the Bureau of Safety Regulation then in existence had developed a proposed revision of part 29, which was published in the Federal Register and circulated as a draft release; circulated, I believe, in about 10,000 copies to all interested segments of aviation, and comments were requested on this proposed revision.

This was an attempt on the part of the Board to make its medical—to bring its medical standards up to date. This development, by the way, had taken place after consultation with many sources, with many persons who have an interest in the Board's medical standards. The total number of comments, I think, were in excess of about 300, most of which were from medical sources, and I believe most of the major medical associations of the United States commented in considerable detail on these proposed provisions.

Well, these proposed provisions, and the many, many comments which we have received on them, are at the moment being reviewed by the Board's staff with a view toward the development either of still another proposal or recommendations to the Board for revision, the holding of an industry conference in Washington, whatever might be required.

I should say that before I leave the committee, sir, I think it would be useful to the committee to have from me a brief description of our rulemaking processes and the machinery through which we insure that competent assistance is obtained in the development of regulations, sir.

Senator MONRONEY. Fine; we will get to that in a moment.

Senator Schoeppel has a question.

Senator SCHOEPPEL. I regret that I was not here at the beginning; I was detained downtown.

To what extent, or shall I say by way of query, do you and your agency collaborate, work with, for instance, the Army, Air Force,

the Navy Air Force, and the Marine Air Force, in their maximum or minimum requirements for physical aptitudes and physical fitness of the pilots in their planes—in their line of endeavor and activity? Do you collaborate very fully along that line?

Mr. BAKKE. Yes, sir; very frequently, in fact. Our most recent collaboration with the medical authorities of all of the military services was on the question of oxygen requirements for high-altitude operation, and we have in our own files all of the pertinent publications and regulations of the military activities involved. We have had discussions with them concerning the assumptions that they make in arriving at certain standards, and so on.

I would say that there is a good deal of consultation between us.

Senator SCHOEPPEL. The reason I asked that, I understand there has been considerable research done along that line, especially as the chairman has mentioned here with reference to the new and different conditions which pilots and those participating must meet in the jet age here and in high altitude flying, compensating for those many factors that they did not have to take into consideration in the ordinary flying altitudes and in the old type of planes.

Now, there is one other thing that I notice you mentioned while I was here.

You seemingly looked with much favor upon additional research in this field. Do you feel that there is a need for a greater expansion along that line, or do you have sufficient funds in your department to carry that type of a research program out, or are you making plans for an enlargement of the research along these lines that we have been discussing, or do you feel that that would be a duplication?

Mr. BAKKE. Sir, in at least one important respect it would be a duplication.

Senator SCHOEPPEL. I see.

Mr. BAKKE. In the field of aviation safety the Board operates as a quasi-legislative agency. It operates as an an arm of the Congress, legislating in a specified field and reporting directly to the Congress. It has no executive functions in this particular field, and we look to the Administrator to carry out the regulations. He provides the medical technicians who actually administer the Board's rules. The Administrator performs much of the research work, for instance, which is pertinent even to our civil-air regulations.

We look to him to perform this kind of work, which is the reason that we stated in our prepared statement that we believe that the Administrator possesses the authority and is now engaged in the kind of planning which enables him to determine quite accurately what research is required and what is as important to make appropriate provision to have that research accomplished.

Senator SCHOEPPEL. Thank you. That is all the questions I have.

Senator MONRONEY. On page 9 where you say:

> A study of United States air-carrier accidents since 1951 was made by our Accident Analysis Division to determine whether physically unfit airmen have been piloting air-carrier aircraft so as to endanger the flying public or persons and property on the ground. The results of this study reveal no significant basis to support a claim on this ground.

I wonder if the committee could have a copy of that study?

Mr. BAKKE. Yes, sir; I would be very, very happy to furnish it.

Senator MONRONEY. Along that same line, I noticed in this morning's paper where there have been 450 plus near misses in the last quarter of the year, I believe.

Mr. BAKKE. This was in the period from September 1956 to December of the same year.

Senator MONRONEY. It was longer than the quarter?

Mr. BAKKE. Yes.

Senator MONRONEY. And it mentioned the fact that they were meeting planes coming the wrong way in the stack, and that 90 percent, I believe, of these were under control conditions.

Mr. BAKKE. No, sir; I believe that that information is in error. I have no copy of that report. Might I ask to have some material put in front of me, sir, I think I might be able to comment more fully.

Senator MONRONEY. Please do.

Mr. BAKKE. Sir, the information which I have is a compilation of statistics on actual midair collisions occurring from 1948 to 1955. I do not have a copy of the report to which you refer, which was released, I believe it was Thursday of last week.

Senator MONRONEY. It was in Sunday's paper.

Mr. BAKKE. Yes; I would be very happy to furnish the committee with a copy of that report.

(Report referred to appears in Mr. Bakke's additional statement, which follows.)

Senator MONRONEY. I wish we could have that.

What I was asking about, since I think it said definitely that 90 percent of these were under control conditions, if you thought it could lead—I think this is important—whether the physical disability occurs in a near miss as it does in a genuine accident.

Mr. BAKKE. Sir, this particular information is in error. I know for a fact that 90 percent of the near misses were not under control.

Senator MONRONEY. We thank you very much for the favor of your testimony. We appreciate your coming up here; and these are the views of the Civil Aeronautics Board?

Mr. BAKKE. They are.

Senator MONRONEY. I might say, speaking very mildly, that it is adverse to the enactment of the bill.

Mr. BAKKE. Yes, sir.

(The following additional statement was submitted by Mr. Bakke:)

SUPPLEMENTAL STATEMENT OF OSCAR BAKKE, DIRECTOR OF THE BUREAU OF SAFETY, CIVIL AERONAUTICS BOARD, ON S. 1045

The Civil Aeronautics Board appreciates this opportunity to present more detailed information regarding some of the statements which Mr. Bakke made to your committee on April 1, 1957, and to provide the answers to some of the allegations made in subsequent testimony before your committee. Copies of the near-miss and accident-analysis reports, in which your committee expressed an interest, are furnished herewith. A copy of part 29: Physical Standards is also included.

When Mr. Bakke appeared before your committee, some interest was shown in the manner in which the regulations are administered and the procedures which are followed in amending the current regulations and promulgating new ones, with particular reference to the physical standards for airman certification.

The physical standards which must be met and maintained by applicants and certificated airmen are set forth in part 29 of the Board's civil air regulations. These standards are quite specific with respect to vision, hearing, and blood pressure, but are more general with reference to a great number of other factors

which contribute to physical fitness. The Administrator, through his Medical Division, has augmented the standards in part 29 with detailed instructions to his designated medical examiners to assist them in conducting the required examinations and in determining which particular physical impairments should be considered disqualifying. Additionally, section 29.5 of part 29 delegates to the Administrator the authority to waive the prescribed standards if he determines that an applicant's experience, ability, and judgment as an airman compensate for his physical deficiency. Approximately 4,000 of these waivers are currently in effect and are applicable to all three classes of medical certificates. Thus, in effect, we have two sets of standards—those prescribed by the Board which serve as a preliminary screening and those utilized by the Administrator in determining whether the applicant should be issued a waiver. The real determination as to whether an applicant will be permitted to fly depends in part on the physical standards prescribed by the Board and in part on the discretion of the Administrator in the issuance of medical waivers.

When an applicant has been unable to obtain a certificate or a waiver from the Administrator, he may apply to the Board for a reconsideration of the Administrator's refusal to issue him a certificate, and arrangements will be made for a hearing at a location convenient for the applicant. These hearings are quasi-judicial, and the petitioner and CAA may be represented by counsel, present pertinent evidence, and call witnesses to testify. Ordinarily, the petitioner will testify, himself; he will call an aviation expert to testify concerning his flying ability; and medical specialists to testify as to his physical fitness. The examiner's initial decision is based largely on the professional standing of the witnesses and the credibility of their testimony. Regardless of the hearing examiner's decision, either side may appeal directly to the Board for reconsideration and, in the event the petitioner is still denied a medical certificate, he may request a Board waiver. In some instances, the Board has granted waivers in cases in which there was strong medical evidence as to the petitioner's physical fitness, and operational limitations could be imposed which would insure that public safety would be adequately safeguarded.

In brief, the Board establishes a broad base for assessing the physical fitness of applicants for airman certificates with a waiver provision which authorizes the Administrator, through his Medical Division, to establish still lower medical standards on an individual basis when compensation has been demonstrated. The interest of the individual is protected by the right of appeal and the further right to apply to the Board for a waiver.

Under the Administrative Procedure Act of 1946, the Board is required to give general notice of proposed substantive rules of general application and afford interested persons an opportunity to participate in the rulemaking procedures. In practice, this is accomplished by the publication of each proposed new rule in the Federal Register and circulation to interested persons in the form of a draft release. The Board members must pass on all amendments to the regulations, but they have delegated to the Bureau of Safety the responsibility to formulate proposed amendments and circulate them to industry, and thereby obtain the benefit of the opinions and experience of many organizations and individuals who might have an interest in the proposals.

After comment is received pursuant to notice of proposed rulemaking, full and complete opportunity for review by the Board is always afforded, which may include oral argument before the Board.

A great many suggestions for amending the regulations are received by the Bureau of Safety from CAA, aviation organizations, interested individuals, and some amendments are recommended by members of the Board's staff. If a suggestion appears to have merit, it will be set up as a Bureau project and assigned to a technician specializing in the subject field who will conduct a thorough study and report his recommendations to the Director of the Bureau to reject the proposal or prepare a draft release for circulation. From the foregoing, it is obvious that a proposal in a Bureau draft release does not in any way reflect Board policy but instead serves as a means for obtaining valuable additional information which may be helpful in formulating a recommendation for presentation to the Board members.

The Board also appreciates this opportunity to comment on some of the statements submitted by Dr. Fenwick on behalf of CAMA when he testified before your committee on April 2, 1957. An examination of the transcript of the proceedings indicates that CAMA is critical of:

1. The current physical requirements prescribed by the Board and the implementation of these requirements by the Medical Division of CAA.

2. The procedures followed in processing amendments to the regulations.
3. The manner in which medical appeals are decided.
4. The accident-investigation procedures of the Board.
5. The conduct of many CAMA members in not reporting the results of their examinations correctly or the names of applicants who are rejected to CAA.

The adequacy of the present physical standards and their implementation was mentioned several times during Dr. Fenwick's testimony. On page 162 of the transcript, Dr. Fenwick stated: "We in civil-aviation medicine are shocked at the lack of research which exists in this field; as doctors examining pilots we know the physical standards are now archaic and are no longer adequate. We find that pilots of all classes are being passed who in some cases we do not believe should be flying. Yet, under the present regulations and the practice, it is impossible to disqualify all of these pilots." Again, on page 167, there appears the following statement by Dr. Fenwick: "At present, CAA medical certification is withheld from less than 1 percent of pilot applicants drawn from a population in which 15 to 25 percent, depending on the class of medical certificate, could not qualify for a CAA medical certificate as has been shown by a study of Selective Service System medical examination findings." Also, on page 168, Dr. Fenwick, in discussing the disqualification of private pilots, stated in part: "* * * 25 percent of the private pilots should be disqualified if we had the proper, stronger regulation."

According to these statements, there is a lack of medical research, and large numbers of pilots who should be disqualified are being allowed to fly. Admittedly, considerable basic research is needed to determine the minimum physical attributes necessary for the safe piloting of aircraft, but a wealth of data is available and many studies have been conducted to determine the adequacy of our physical standards in providing a high level of safety and yet permit the greatest number of people possible to engage in avaiation pursuits—one of the Board's prime responsibilities under the Civil Aeronautics Act.

The Airline Medical Examiners Association, now known as the Civil Aviation Medical Association, came to the attention of the Board when we received a letter from the president of the association, Dr. Gerald Backenstoe, on October 18, 1954. Dr. Backenstoe informed us that his association was quite concerned about the need for appropriate Federal legislation to insure adequate authority and participation of the medical profession in medical decisions affecting certification of civil airmen, and suggested that it would be very useful for his committee to meet with the Board or its representatives to discuss these matters fully. This letter was answered on October 27, 1954, over the signature of the Chairman of the Board, indicating that our staff would be happy to meet with the committee, and suggested that Dr. Backenstoe call or write the Director of the Bureau of Safety Regulation to fix a mutually convenient time and place for the discussion. Dr. Blakenstoe replied on November 9, 1954, stating that as soon as he was able to make suggestions as to dates for such a visit, Mr. Joel Fisher, their counsel, would be in touch with the Director in order to fix a mutually convenient time and place for the discussions. No further contact was made with the Board, and consequently the proposed meeting never took place.

About the same time the Board was requested by Senator Bricker to comment on a letter which he had received from the Airline Medical Examiners Association recommending the same legislation as that proposed in S. 1045. Even though the allegations contained in his letter appeared unfounded, the Board directed the Bureau of Safety Investigation to conduct a survey of airline accidents to determine if any had been caused by physical deficiencies of the flight crew. A copy of this study for the years 1950–54, revised to include 1955 and 1956, is included as appendix I.

In order to determine the effect of physical deficiencies of flight crews on airline accidents, it was decided to compare the accident record of those airline transport and commercial pilots who had been issued a waiver by the CAA with the record of those without any deficiency. If physical deficiencies were responsible for any appreciable number of airline accidents, then we would expect to find more accidents occurring among the group of pilots who had been unable to meet the physical standards prescribed by the Board. No significant variance between the two groups, in what may be termed accident proneness, was disclosed. Attachment 3 of the report is a comparison of the accident record of the two groups. Furthermore, the résumé of accidents included in attachment 4 of the report reveals that there was no relation between the cause

of the accident and the physical deficiency of the pilot as entered on his waiver. Finally, there is no record in the Board's files of any accident in scheduled airline transportation which was found to be caused by a physical deficiency of the pilot or copilot.

A member of our staff conducted a review of available CAA records to determine if physical deficiencies were having any appreciable effect on nonairline civil-aviation operations. According to a memorandum received from the Director, Office of Aviation Safety, of CAA, dated May 2, 1956, there were 8 accidents in 1954, wherein the physical condition of the pilot was classified as a probable cause, and 7 such accidents in 1955. An examination of the accident-investigation files relating to these 15 accidents revealed that in only 3 was the physical condition of the pilot definitely found to be the probable cause. The reports of these 3 accidents indicated that 1 had complained of a pulmonary condition, 1 had been subject to muscular spasms following an operation, and 1 may have had a history of epilepsy. These 15 accidents represent one-fourth of 1 percent of the total number of accidents which occurred during this 2-year period.

Dr. Fenwick, in his testimony, as reported on page 168 of the transcript, stated: "* * * * where 25 percent of the private pilots should be disqualified if we had proper, stronger regulations." A comparison between the figure of 15 accidents mentioned above, out of the approximately 6,000 accidents which occurred during the 2-year period, 1954–55, with Dr. Fenwick's proposal, which would disqualify over 50,000 individuals who were certificated and flying during this period, appears to be a drastic solution to a problem which certainly is not acute.

The procedures followed by the Board in amending and revising the regulations were also questioned by Dr. Fenwick, particularly with reference to draft release 56–6, which contained proposed amendments to the physical standards for airmen and the duration of medical certificates. This draft release was prompted by recommendations received from many sources, including CAA, the CAB General Counsel, the hearing examiners of the Board, many individuals, and the result of past research studies and a marked increase in the number of requests for medical waivers.

The proposed modifications in the physical standards were directed primarily to the vision and hearing requirements and to a proposed modification of the waiver provision in the final section of the part. These changes were prompted by the frequency with which visual deficiencies were waived by the CAA and the recommendations of a group of medical experts from 38 ICAO nations who met in Paris in April 1955 to consider the international visual and hearing standards for airmen. The visual standards recommended by this world group are identical with those proposed in the draft release. The change in the visual-acuity requirements from a practical standpoint conforms the regulations to what is now being accomplished by the issuance of waivers by the CAA.

The ICAO group also decided not to include the phoria or depth-perception tests as a requirement, as it was generally agreed that these tests did not relate particularly to the vision requirements for safe operation of an airplane. The draft release omitted these tests but retained the requirement of normal fields of vision, the ability to distinguish aviation colors, and of accommodation for near vision. Although no decision has been made regarding the specific requirements which will be recommended to the Board for adoption, the comment received was overwhelmingly in favor of the proposed changes at a ratio of 3 to 1 in favor of the new visual-acuity requirements and of 5 to 1 in favor of deleting the depth-perception requirement.

The proposal to increase the interval between physical examinations was prompted by the controversy which has existed for many years regarding the safety value of frequent physical examinations when related to the expense and incidental inconvenience to the certificate holders. It is obvious that the frequency of physical examinations does not establish the standards of physical fitness. The physical condition of the pilot between examinations is covered in part 43 of the civil air regulations, which forbids a pilot to exercise the privileges of his certificate during any period of reduced physical fitness which would render him unable to meet the physical requirements for the issuance of his currently effective medical certificate.

We do not know of any study which has related accidents to the relative length of time between physical examinations, but since CAA is now responsible for investigation of small aircraft accidents, we have requested an examination of CAA records to determine if such a relationship exists. A further examination

of the 15 cases, previously mentioned, in which the physical condition of the pilots may have caused the accidents, revealed that the 4 accidents involving student pilots occurred within 1 year of the last physical examination, more than 50 percent of the accidents involving private pilots occurred during the first year subsequent to their physical examinations, and three-fourth of the accidents involving commercial pilots occurred within the first 3 months after their last physical examination. The only logical conclusion which can be drawn from this small sampling is that the frequently of physical examinations has little if any effect on flight safety.

Many of the individuals and organizations commenting on the frequency of medical examinations presented logical arguments both for and against any change in the present reexamination intervals. Most of the organizations representing the airline interests were in favor of retaining the present requirements while the organizations representing the commercial and private-pilot interests were generally in favor of the proposed extensions. AOPA, an organization which represents 65,000 private and commercial pilots, endorsed the Board's proposed rule.

All of the comment received will be analyzed and given careful consideration by the Bureau before formulating its recommendation to the Board for final action on this proposal.

The manner in which medical appeals are decided by the Board was criticized by Dr. Fenwick, as reported on page 156 of the transcript, and again by Mr. Fisher on page 170. Part of this criticism was based upon the alleged fact that pilots were being authorized to fly over the objections of the medical examiner in the field and the Medical Department of CAA "without any further medical consultation." Section 602 of the Civil Aeronautics Act provides for a review of the refusal of the Administrator to issue an airman certificate. Under the Administrative Procedure Act and the regulations of the Board, hearings are conducted by a hearing examiner qualified in accordance with the provisions of this act. The regulations of the Board further provide for an appeal from the hearing examiner's initial decision to the members of the Board. The hearing is a quasi-judicial procedure and the examiner's decision must be sustained by substantial probative evidence. Under this procedure, both parties have the right to present evidence and to call and cross-examine witnesses. Expert medical testimony may be introduced by either party. It cannot be said, therefore, that a decision by the Board is made "without further medical consultation." Obviously, under a procedure of this nature, testimony such as that referred to by Mr. Fisher on page 171 of the transcript: "Well, we have examined him, we have known him since he's been a little boy, he seems all right to us," would be given little weight.

As a matter of procedure, the medical examiner's report of the applicant's physical examination is introduced in evidence in every case. Mr. Fisher contends that these reports are not given more weight by the hearing examiners than the other medical testimony by doctors who are not aviation medical specialists. The weight to be given any expert testimony is a matter for evaluation by the hearing examiner and should not be restricted by an inflexible rule such as inferred by Mr. Fisher.

As reported on page 159 of the transcript, Dr. Fenwick observes that there is no provision for direct medical participation in aircraft-accident investigation or for physical examination and/or autopsy of pilots or passengers involved in aircraft accidents. One of the responsibilities of the Board is to investigate aircraft accidents, and to determine, wherever possible, the probable cause so that this information may be used to avoid similar occurrences. Whenever it is appropriate, the Board secures medical advice, and coroner's reports are available in all applicable cases investigated by the Board.

In explaining why the examiners turn down such a small percentage of pilot applicants, Dr. Fenwick is reported on page 173 of the transcript as giving the following reason: "* * * they are reluctant to commit themselves against an applicant if they feel there is a possibility the applicant will obtain medical certification upon appeal to the CAB." It seems unreasonable that qualified medical doctors would knowingly issue medical certificates to unqualified persons for the reason given.

In addition, according to Board records, a total of 10 medical cases were disposed of by the Board and its hearing examiners during fiscal 1956. Of these, seven resulted in affirmances of the medical examiners' reports and the refusal of the Medical Department of CAA to issue certificates. Under these circumstances it would appear that the effect of the Board's findings on medical

cases has either been exaggerated or the Board's adverse decisions given importance far beyond reasonable limits within the ranks of the medical examiners.

In summary, we have studied the testimony presented by CAMA in favor of the proposed legislation and conclude that it consists mainly of arguments based on inferences and suppositions which could not be substantiated by factual evidence. We, therefore, reiterate our previous arguments in opposition to S. 1045.

Appendix 1

Relationship of Air Carrier Aircraft Accidents to Pilot Physical Standards

PILOTS-COPILOTS

The average annual number of pilots-copilots engaged in air carrier flying operations was 10,117 in the 7-year period 1950–56. This includes all types of air-carrier operations involving the scheduled domestic and foreign/overseas services, the irregular (supplemental), and Alaskan carriers.

ACCIDENTS

The average annual number of accidents recorded in these operations during the 7-year period was 103. In relation to the 10,117 pilot-copilot employment, the average pilot involvement in accident, percentagewise, was 1.02. To put it another way, for practical purposes only about 1 percent of the pilots-copilots were involved in an air carrier aircraft accident in each year of the period. (See attachment No. 1.)

CAUSAL FACTORS OF ACCIDENTS

In the determination of causal factors in an accident, more than one factor is usually present. Consequently, the number of causes exceed the actual number of accidents involved. No so-called primary cause is selected because experience has shown that all causes are of equal prominence.

For the purpose of this report, the causal factors of all air-carrier accidents during 1954 and 1955 are discussed.

In relation to 192 accidents during the 2-year period, there were 369 casual factors. Pilot factors were involved in 115 (31.1 percent). Other personnel factors of maintenance, inspection, airport personnel, and personnel engaged in other activities accounted for 43 causes (20.7 percent). In other words, the total personnel factor was involved in 191 (51.8 percent) of the total 369 casual factors of the 192 accidents.

With respect to those factors relating to the pilot, not a single one could be connected in any way with physical defect/deficiency of any pilot. In broad aspects, they were connected to the factors of technique, judgment, or carelessness, and not to physical standards.

As a matter of interest, 178 (48.2 percent) of the total 369 casual factors in the 192 accidents involved factors of powerplant, airframe, landing gear, equipment and accessories, weather, airport terrain, and miscellaneous (including 2 undetermined). (See attachment No. 2.)

PILOT INVOLVEMENT IN RELATION TO PILOT FACTORS

As noted previously, the pilot causal factors in the 369 accidents that occurred during 1954–55 totaled 115 (31.1 percent). Consequently, the relationship of the pilot factor to the annual average number of pilots-copilots employed in those 2 years—11,541—was 1 percent.

PILOTS ISSUED WAIVERS

Special attention was directed to accidents involving pilots who had been issued airline medical certificates in the presence of waived physical retirements during 1950–56. The average annual number in this category during the 7-year period was 183. This means that in each year of the period 1.64 pilots within the waiver category were involved in accident. This compares with a 1-percent involvement for nonwaiver pilots. See attachment No. 3.) It is emphasized that no accident involving the waiver pilot could be connected with the physical deficiency/defect for which the waiver was granted. A list of the 20 accidents

involved is attached showing the casual factors for each accident. (See attachment No. 4.) In addition, a statistical recapitulation of causal factors is attached. (See attachment No. 5.)

SAFETY RATES

To illustrate the high safety factor in United States air carrier operations, the scheduled domestic passenger services involving transport-type aircraft in the calendar years 1951–55 flew an aggregate 12.4 million hours. The fatal-accident rate was 0.18, the nonfatal 1.39, and the total rate 1.57 per 100,000 hours flown. The rate of accidents involving the pilot factor was 0.74 per 100,000 hours.

In the scheduled foreign/overseas passenger operations, an aggregate 2.4 million hours were flown in the same period. The fatal accident rate was 0.27, the nonfatal 1.21, and the overall 1.48 per 100,000 hours of flight. The rate of accidents involving the pilot factor was 0.74, identical with the rate that prevailed in the domestic operations.

ATTACHMENT No. 1.—*Relationship of pilots to air carrier aircraft accidents calendar years 1950–56*

Calendar year	Total, pilots-copilots	Accidents	Percent in accident
1956	[1] 12,936	106	0.82
1955	11,446	96	.84
1954	10,095	97	.96
1953	10,037	96	.96
1952	9,370	107	1.14
1951	8,986	118	1.31
1950	7,877	103	1.31
Annual average	10,107	103	1.02

[1] Estimated.

ATTACHMENT No. 2.—*Causal factors of air carrier aircraft accidents, calendar years 1955 and 1954*

Causal factors	Calendar year				Total	
	1955		1954			
	Number	Percent	Number	Percent	Number	Percent
Personnel:						
Pilot	62	33.5	53	28.8	115	31.1
Maintenance	14	7.6	6	3.2	20	5.5
Airport	1	.5	2	1.1	3	.8
Other	26	14.1	27	14.7	20	14.4
Subtotal	103	55.7	88	47.8	191	51.8
Other:						
Powerplant	13	7.0	11	6.0	24	6.5
Airframe	2	1.1	2	1.1	4	1.1
Landing gear	13	7.0	16	8.7	29	7.9
Equipment—accessories	7	3.8	4	2.2	11	3.0
Weather	30	16.2	51	27.7	81	21.9
Airport—terrain	15	8.1	6	3.3	21	5.7
Miscellaneous	1	.6	5	2.7	6	1.6
Undetermined	1	.5	1	.5	2	.5
Subtotal	82	44.3	96	52.2	178	48.2
Grand total, causal factors	185	100.0	184	100.0	369	100.0
Accidents	96	100.0	96	100.0	192	100.0

NOTE.—Number of causal factors exceed actual accident totals; usually more than 1 causal factor is present in a single accident.

ATTACHMENT No. 3.—*Relationship of waiver and nonwaiver pilots to air carrier aircraft accidents (calendar years 1950–56)*

Calendar year	Pilots					
	Number		Number in accident		Percent in accident	
	Waiver	Nonwaiver	Waiver	Nonwaiver	Waiver	Nonwaiver
1956 [1]	220	12,716	4	102	1.82	0.80
1955	213	11,233	8	88	3.76	.78
1954	185	9,910	2	95	1.09	.96
1953	181	9,856	2	94	1.11	.96
1952	158	9,212	2	105	1.27	1.03
1951	166	8,820	1	117	.60	1.32
1950	160	7,717	1	102	.63	1.39
Annual average	183	9,923	3	100	1.64	1.00

[1] Estimated with respect to pilot totals.

ATTACHMENT NO. 4.—*Résumé of facts, conditions, and circumstances of air carrier accidents involving pilots holding class 1 medical certificates in the presence of waived physical requirements (calendar years 1950–56)*

Date	Location	Aircraft	Injury index	Pilot			Airline
				Age	Hours	License	
Aug. 15, 1950	Omiat, Alaska	Noorduyn Norseman.	Serious	(?)	3,000 plus	Commercial	Irregular.
Waiver: Deficient accommodation. Causal factors of accident: (1) Pilot made inadequate inspection of undeveloped takeoff area; (2) runway too short. Pilot did not check the river area from which he made his takeoff and ran into a dead-end channel. Power was cut when aircraft had failed to become airborne after a run of approximately 1½ miles and the aircraft ran into a sandbar and capsized.							
June 1, 1951	Columbus, Ga	DC–3	No injury	29	6,000	Air transport	Scheduled.
Waiver: Defective color vision. Causal factors of accident: (1) Wet runway; (2) unfavorable wind conditions; (3) wind shift. As the aircraft was landed in the 1st third of the runway, the wind shifted suddenly to a tailwind. The aircraft failed to decelerate and ran off the runway end.							
Apr. 18, 1952	Near Whittier, Calif.	C–46	Fatal	46	7,000	do	Irregular.
Waiver: Heart condition. Causal factor of accident: Pilot let down below minimum altitude for which he was cleared. Flight was cleared for a straight-in instrument approach to Los Angeles to maintain 3,000 feet altitude until leaving the Downey marker. The flight failed to maintain course and minimum altitude and flew into a hill at an elevation of 980 feet. The pilot of this aircraft was flying in direct violation to his class 1 medical certificate that limited him to check pilot duties only. The investigation failed to disclose any evidence that the pilot's heart condition bore any direct relationship to the accident.							
July 22, 1952	Naknek, Alaska	Stinson	Serious	23	1,400	Commercial	Alaskan.
Waiver: Eye injury. Causal factors of accident: (1) Failed to compensate for gusty cross-wind; (2) lost flying speed in severe gusty wind conditions; (3) gusty cross wind. Full flaps were being used during a gusty cross-wind landing. The aircraft ballooned several times and the pilot initiated a go-around, however, the aircraft stalled, struck a building, nosed over, and burned.							
July 5, 1953	Atlanta, Ga	C–46	do	33	9,900	Air transport	Irregular.
Waiver: Deficient accommodation Causal factor of accident: Turbulence. Sudden, unexpected turbulence was encountered while in normal cruise. Most of the passengers were sleeping but due to the suddenness of the turbulence there was not time to warn hostess or passengers to fasten safety belts. 1 passenger was injured seriously.							

ATTACHMENT No. 4.—*Résumé of facts, conditions, and circumstances of air carrier accidents involving pilots holding class 1 medical certificates in the presence of waived physical requirements (calendar years 1950–56)*—Continued

Date	Location	Aircraft	Injury index	Pilot			Airline
				Age	Hours	License	
December 6, 1953	Johnston Island	B–377	No injury	34	7,000	Air transport	Scheduled.
Waiver: Muscle pathology—arm-atrophies. Causal factor of accident: Propeller and propeller accessories failure. No. 4 powerplant tore free of the aircraft and fell into the ocean. A severe buffeting occurred and the aircraft descended in a diving right turn requiring the efforts of both pilots to bring it under control. As a result of efficient piloting and crew coordination, control was regained and maintained with difficulty for approximately 3 hours, at which time a safe landing was effected on a mid-Pacific island.							
November 13, 1954	Kingston, Jamaica	C–46	Serious	46	9,000	do	Irregular.
Waiver: Defective distant vision; Right eye 20/100; left eye 20/70 (both corrected to 20/20). NOTE.—This airman was copilot on flight. Pilot in command had no waiver for physical deficiency and/or defect. Causal factor of accident: Turbulence. The flight encountered a short period of severe turbulence and the 2 cabin occupants (dead-heading crew members, were thrown from their hammocks. One received serious and the other minor injury. Waiver: Restricting lens (eyes). Causal factors of accident: (1) Front safety cable of ski failed; (2) turbulence. Strong turbulence was encountered in flight and evidence indicated that the right front ski safety cable failed. The ski rotated on the axle to reverse position prior to landing and the aircraft veered sharply and nosed up.							
Jan. 15, 1955	Over Calvert, Md.	L–1049	do	48	13,400	do	Scheduled.
Waiver: Slightly deficient hearing which improves and again lessens. Causal factor of accident: Sudden, clear air turbulence. Sudden, unexpected, clear air turbulence was encountered while cruising at about 21,000 feet. The seat belt sign was not on and several passengers were thrown about in their seats, 2 sustaining serious injury.							
Jan. 30, 1955	Coal City, Ill.	C–46	No injury	31	8,184	do	Irregular.
Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Maintenance—engine oil was not changed according to manual specifications (water was found in oil supply); (2) pilot failed to draw more power on good engine sufficiently early after emergency to maintain altitude; (3) leak in oil cooler caused loss of engine oil. A rapid drop in oil pressure and quantity necessitated shutting down the left engine. All attempts to feather the propeller were unsuccessful and when flight was unable to maintain altitude a wheels-up landing was made in an open field.							

Feb. 6, 1955 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factor of accident: Gear strut fork failed at weld. A ground loop occurred following failure of the left gear strut during landing.	Ruby, Alaska	Cessna	do	46	12,000	Commercial	Alaskan.
Mar. 5, 1955 Waiver: (Copilot—color vision.) Causal factor of accident: Commissary service door locking parts misaligned. During takeoff the commissary service door blew off and lodged against the leading edge of the left stabilizer. The flight returned to the airport and made a wheels-up landing.	Atlanta, Ga	CV-340	do	37	10,070	Air transport	Scheduled.
Nov. 16, 1955 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Brakes overheated and failed; (2) unfavorable weather conditions. After a long cross-wind taxi, the brakes failed and directional control was lost. The aircraft weathercocked, went off ramp, and collided with a concrete foundation.	Chicago, Ill	C-46	do	46	10,500	do	Do.
Nov. 17, 1955 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Maintenance and inspection-propeller blades improperly indexed during repairs; propeller dome retaining nut not tightened sufficiently; improper inspection procedures during maintenance and repair work. No. 4 engine overspeeded following first power reduction during takeoff. Attempts to reduce r. p. m. and feather the propeller were unsuccessful. The No. 4 propeller drag was such that it was impossible to maintain altitude and pilot was forced to make a crash landing. While attempting to land in the least populated area available the aircraft struck a telephone pole and trees and settled in a nose-high altitude.	Seattle, Wash	DC-4	Fatal	40	5,920	do	Irregular.
Nov. 18, 1955 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: Pilot—(1) failed to disengage gust locks; (2) failed to check control freedom prior to takeoff. Weather—(1) unfavorable wind conditions. Failed to disengage the gust locks prior to starting takeoff roll and the takeoff was aborted.	Allentown, Pa	M-404	No injury	46	14,575	do	Scheduled.
Dec. 4, 1955 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Pilot failed to observe proper wing tip to building clearance; (2) other personnel—ground signalman failed to give clear and understandable signals to pilot. The left wing struck the spectator deck of the terminal building while the aircraft was being taxied into gate position.	Tokyo, Japan	B-377	do	41	13,018	do	Do.

ATTACHMENT NO. 4.—*Résumé of facts, conditions, and circumstances of air carrier accidents involving pilots holding class 1 medical certificates in the presence of waived physical requirements (calendar years 1950–56)*—Continued

Date	Location	Aircraft	Injury index	Pilot			Airline
				Age	Hours	License	
Feb. 20, 1956 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factor of accident: Malfunction of landing gear actuating microswitches. The malfunction of at least 2 of the landing gear actuating microswitches during the approach, permitted the propellers to go into the 17° pitch position, and the aircraft dropped in very hard.	Chicago, Ill.	Viscount	No injury	55	17,752	Air transport	Scheduled.
Apr. 24, 1956 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: Pilot—(1) failed to fully extend gear; (2) failed to make cockpit check. Captain, in right seat, failed to extend the gear fully prior to landing and landed with the nose gear retracted.	San Francisco, Calif.	DC–7	do	50	6,410	do	Do.
July 2, 1956 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Powerplant, undetermined; (2) low ceiling, rain, fog, smoke; (3) pilot—aircraft overloaded; attempted to continue visual flight rules in marginal weather over mountainous terrain. Indications are that the weather in the vicinity of the accident included low ceilings with visibility restricted in light rain, fog, and smoke. Examination of the wreckage indicated that the pilot was attempting to make a wheels-up single-engine landing in an area of generally rolling terrain comprised of tundra and swamps. The left propeller was found in a feathered position. The aircraft first made contact on the tail skid that struck a low ridge while in a nose-high altitude.	Nome, Alaska	De Havilland Dove.	Fatal	38	4,200	Commercial	Alaskan.
July 25, 1956 Waiver: Eyes—required to wear correcting lenses while exercising the privileges of his airman's certificate. Causal factors of accident: (1) Pilot—Failed to ascertain that generator switches were on; (2) failed to make visual check for gear-down position. Following takeoff, crew failed to check whether the generators were on. With generator switches in the "off" position the batteries became discharged and radio equipment and flight instruments became inoperative. A landing was made wheels up due to lack of electrical power for gear operation.	Baltimore, Md.	Viscount	No injury	49	13,040	Air transport	Scheduled.

ATTACHMENT NO. 5.—*Causal factors of air-carrier aircraft accidents involving pilots issued waiver for physical deficiency or defect*

[Calendar years 1950–56]

Causal factors	1956		1955		1954		1953		1952		1951		1950		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Pilot	6	66.7	4	26.7	0	0	0	0	3	75	0	0	1	50	14	36.9
Maintenance	0	0	4	26.7	0	0	0	0	0	0	0	0	0	0	4	10.5
Airport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	1	6.6	0	0	0	0	0	0	0	0	0	0	1	2.6
Subtotal	6	66.7	9	60.0	0	0	0	0	3	75	0	0	1	50	19	50.0
Powerplant	2	22.2	1	6.7	0	0	1	50	0	0	0	0	0	0	4	10.5
Airframe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landing gear	0	0	2	13.3	1	33.3	0	0	0	0	0	0	0	0	3	7.9
Equipment and accessories	0	0	1	6.7	0	0	0	0	0	0	0	0	0	0	1	2.6
Weather	1	11.1	2	13.3	2	66.7	1	50	1	25	2	66.7	0	0	9	23.7
Airport-terrain	0	0	0	0	0	0	0	0	0	0	1	33.3	1	50	2	5.3
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undetermined	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	3	33.3	6	40.0	3	100.6	2	100	1	25	3	100.0	1	50	19	50.0
Grand total	9	100.0	15	100.0	3	100.0	2	100	4	100	3	100.0	2	100	38	100.0
Accidents	4		8		2		2		2		1		1		20	

NOTE.—Number of causal factors exceed actual accident totals; usually more than 1 causal factor is present in a single accident.

Source: Civil Aeronautics Board, Bureau of Safety, Analysis Division, Mar. 29, 1957.

APPENDIX 2

CIVIL AERONAUTICS BOARD,
Washington, D. C., March 30, 1957.

The Civil Aeronautics Board said today it received voluntary pilot reports indicating 452 near collisions in military and civil plane operations in the United States during the last 4 months of 1956.

The Board began its near-collision survey program last May. Its first interim report is a statistical analysis without comment or Board conclusions. It was distributed today to appropriate Government and industry sources for review in an effort to accelerate solution of current air-traffic problems.

The 259 reporting military pilots said that among the second aircraft involved in the incidents were 131 military, 104 civil, and 24 unidentified planes. The 193 reporting civil pilots said their near collisions involved 73 military, 110 civil, and 10 unknown planes. Of the reporting civil pilots, only 83 were on scheduled airline flights.

An estimated 4,500 persons were aboard the reporting pilots' planes, the reports said. No estimates were made as to persons aboard the other aircraft involved.

Statistics showed 55 percent of the flights reporting were in point-to-point transit. The remainder were training, check or local flights, or unreported as to type.

Nearly 9 out of 10 of the reported incidents occurred in controlled airspace; 55 percent were en route as opposed to arriving or departing at airports. Of the arrival and departure incidents, about three-fourths occurred below 3,000-foot altitudes.

The pilots said about 40 percent of the other aircraft were crossing their courses; 38 percent approached head on, and 20 percent were roughly on the same course as the reporting pilot.

Evasive action was taken in 313 cases and in 51 others it was impossible, the pilots reported. About one-third of the planes involved were said to be jets.

The Board pointed out that during the first 4 months of its voluntary reporting program, distortion occurred because a large number of the pilot reports related to previous incidents. Its statistical summary, therefore, covers only the reports of current incidents during the second 4 months of the program's existence—September through December of last year.

(Copies of the interim report are available on request from the Civil Aeronautics Board.)

STATISTICAL FACTORS OF NEAR COLLISIONS REPORTED TO THE CIVIL AERONAUTICS BOARD (SEPTEMBER–DECEMBER 1956)

Bureau of Safety Analysis Division, United States Civil Aeronautics Board,
Washington, D. C., March 25, 1957

FOREWORD

Purpose

The purpose of this report is to furnish pertinent statistical information developed through the analysis of 452 voluntary reports received from civil and military pilots relating to near collisions in which they were involved during September–December 1956.

The Board's near-collision program

On February 23, 1956, the Civil Aeronautics Board adopted Special Regulation SR–416: Voluntary Pilot Report of Near Midair (Near-Miss) Collision. The purpose of this special regulation is to protect the information reported voluntarily by the pilot from any use in any disciplinary or enforcement proceedings that might be instituted against him in relation to the specific incident reported.

The program was put into active operation in May 1956 and during June–August 1956 a total of 1,410 near collisions was reported; however, a very large number of these related to incidents that dated back months and years previous to the time of reporting. Consequently, they were not indicative of the current situation, and no report was made for dissemination to appropriate authorities.

Basis of information

The statistical information furnished in this report was derived from an analysis of the 452 reports submitted by pilots during September–December 1956, a daily average of 3.7. It relates only to incidents that occurred within the continental limits of the United States during this period. Of the 452 reports, military pilots accounted for 259 (57 percent) and civil pilots for 193 (43 percent).

DETAILS OF REPORT

Personnel exposure in near collisions

A total of 4,429 persons was aboard the reporting aircraft in the 452 near collisions reported; the number aboard the "other" aircraft involved is not known.

Class of operations (reporting aircraft)

The classes of operation involved in the 452 near collisions were as follows:

	Reporting pilots	Other aircraft involved		
		Military	Civil	Unknown
Military	259	131	104	24
Civil	193	73	110	10
Total	452	204	214	34

The civil aircraft operations involved were reported as follows:

Scheduled air carrier	83
General aviation	82
Other air transport	12
Business	8
Unknown	8
Total	193

Kinds of flying

In the 452 near collisions, the following kinds of flying were reported:

Kinds of flying	Reporting pilots			
	Civil	Military	Total	Percent
Transit	150	100	250	55
Training-check	14	97	111	25
Local	21	37	58	13
Not reported	8	25	33	7
Total	193	259	452	100

Occurrences in relation to airspace

The 452 incidents occurred as follows:

	Number	Percent
In controlled airspace	406	89
Outside controlled airspace	35	8
Not reported	11	3
Total	452	100

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The incidents occurred while:

	Number	Percent
(a) En route	251	55
(b) Arriving/departing airports having a control tower	172	38
(c) Arriving/departing airports having no control tower	26	6
(d) Not reported	3	1
Total	452	100

En route incidents

The altitudes and certain selected factors involved in the en route incidents were:

Feet	In controlled airspace				Other factors			
	Yes	No	Unknown	Total	Overtaking	Jet	Conditions [1]	
							VFR	IFR
To 3,000	36	9	0	45	7	8	28	6
4,000 to 15,000	149	8	1	158	36	28	130	33
16,000 to 29,000	16	3	1	20	3	14	18	8
30,000 plus	11	0	0	11	0	11	11	0
Not reported	16	1	0	17	1	6	12	5
Total	228	21	2	251	47	67	199	52

[1] Refer to paragraph on general flight conditions, p. 4, for definition.

Arrival/departure incidents

(a) Airports with control tower:

	Number	Percent
Feet:		
3,000 and below	109	64
Above 3,000	45	26
Altitude not reported [1]	18	10
Total	172	100
On an IFR clearance	64	37
VFR in contact with tower	92	53
VFR—no contact with tower	16	10
Total	172	100
Visibility:		
Less than 3 miles	47	28
3 to 5 miles	21	12
Over 5 miles	104	60
Total	172	100
Jet aircraft involved	73	42

[1] In 71 of these 109 incidents the speed range of the aircraft involved was under 200 miles per hour; in 26 incidents the speed of one or both aircraft was in excess of 200 miles per hour. The speeds were not reported in the remaining 12 incidents.

(b) Airports without control tower:

Feet:	
3,000 and below	26
Above 3,000	0
Total	26

Visibility:	
Less than 3 miles	3
3 to 5 miles	0
Over 5 miles	23
Total	26

The speed range was less than 200 miles per hour with respect to all 26 incidents.

Type of clearance

The 452 reporting aircraft were operating in accordance with the following:

	Number	Percent
IFR clearance	184	40
IFR, no ATC clearance	7	2
VFR operation	256	57
Not reported	5	1
Total	452	100

General flight conditions

To determine the existing conditions, the flight visibility and distance from clouds as reported were taken into consideration and the following flight weather conditions were established:

For the purpose of this report, VFR conditions were considered to exist when the visibility was 3 miles or better aand the aircraft was at least 2,000 feet horizontally and 1,000 feet above or 500 feet below the cloud formation.

Conditions less than the above values were classified as IFR. This classification does not coincide exactly with CAR Part 60 definitions, therefore, some of the incidents classified as IFR actually occurred while the aircraft were legally operating in accordance with VFR.

Conditions	Number	Percent
VFR	347	76
IFR	102	23
Not reported	3	1
Total	452	100

Time of day

The reported 452 incidents occurred as follows:

	Number	Percent
Daylight	328	72
Night	84	19
Twilight	33	7
Dawn	4	1
Not reported	3	1
Total	452	100

Operational phase

The operational phases involved in the 452 incidents were:

	Number	Percent
(a) Reporting aircraft:		
Level flight	244	53
Descending	59	13
Landing	57	13
Climbing	46	10
In turn	16	4
Holding	16	4
Takeoff	14	3
Total	452	100
(b) Other aircraft involved:		
Level flight	217	48
Descending	61	13
Climbing	53	12
Landing	35	8
In turn	17	4
Takeoff	9	2
Acrobatics	7	2
Holding	2	
Unknown	51	11
Total	452	100

Relative course of aircraft

The relative closing courses of the aircraft involved in the 452 near collisions were:

	Number	Percent
Crossing	184	40
Head on	172	38
Overtaking	89	20
Not reported	7	2
Total	452	100

In 24 incidents (27 percent), the reporting pilot stated that his was the overtaking aircraft.

Relative position of other aircraft

The reporting pilots stated that the other aircraft appeared or approached from the following points, expressed in terms of the clock.

Point of approach	Number	Percent
12 o'clock	147	32
1 o'clock	29	7
2 o'clock	29	7
3 o'clock	26	5
4 o'clock	17	4
5 o'clock	11	2
6 o'clock	33	7
7 o'clock	4	1
8 o'clock	9	2
9 o'clock	44	10
10 o'clock	29	7
11 o'clock	34	7
Not reported	40	9
Total	452	100

Separation distances

(*a*) When collision appeared to be imminent: In the 452 incidents the reporting pilots first became aware of the imminence of a "near collision" at the following distances:

	Number	Percent
Within 100 feet	59	13
Within 100 to 500 feet	124	27
Within 500 to 2,000 feet	136	30
Within 2,000 feet to 1 mile	65	14
Within 1 to 3 miles	35	8
Within 3 to 5 miles	16	4
Not reported	17	4
Total	452	100

In 340 (75 percent) incidents the reporting pilots did not observe the other aircraft prior to the time a "near collision" was believed to be imminent. In 78 (17 percent) of the incidents the reporting pilot observed the other aircraft prior to this but at the time did not feel that a hazard existed.

(*b*) Closeness of "near collision":

	Number	Percent
Within 100 feet	123	27
Within 100 to 500 feet	202	45
Within 500 to 1,000 feet	45	10
Over 1,000 feet	22	5
Not reported	60	13
Total	452	100

In this connection, 313 (69 percent) of the reporting pilots took evasive action and in 51 incidents (11 percent) it was stated that evasive action was impossible.

Types of aircraft involved

The following general types of aircraft were involved:

Reporting aircraft	Other aircraft	Number	Percent
Piston	Piston	260	57
Do	Jet	70	16
Do	Unknown	25	6
Jet	Piston	39	9
Do	Jet	36	8
Do	Helicopter	1	
Helicopter	Piston	2	
Not reported		19	4
Total		452	100

Airspeeds at time of incident

	Number	Percent
Both aircraft under 200 miles per hour	261	57
1 or both aircraft in the range between 200 and 300 miles per hour	121	27
1 or both aircraft in excess of 300 miles per hour	62	14
Speed not stated	8	2
Total	452	100

Altitude ranges at time of incident

Altitudes	Number	Percent
3,000 feet and below	182	40
4,000 to 15,000 feet	200	44
16,000 to 29,000 feet	24	5
30,000 feet and above	11	3
Not reported	35	8
Total	452	100

Aircraft lighting

The reporting pilots stated that the following aircraft lights were in use at the time of the occurrence. In a number of cases, two or more combinations of lights were being used. Accordingly, these statistics do not coincide with the actual number (452) of incidents reported.

	Reporting aircraft	Other aircraft
Rotating anticollision	86	45
Red passing (on nose)	45	13
Flashing navigation	116	64
Steady navigation	31	29
Landing	13	4
Ice	10	5
Other	4	1

Recapitulation of certain selected factors

In the 452 incidents the following circumstances or factors existed:

Item	Number	Percent
In controlled airspace	406	89
VFR conditions	347	77
IFR conditions	102	23
Daylight	328	72
Piston versus piston	260	57
Both aircraft under 200 miles per hour	261	57
In transit	250	55
In level flight	244	54
Head on	172	38
Arriving or departing airport with control tower	172	38
Jet aircraft involved	146	32
Military versus military	131	29

APPENDIX 3

CIVIL AERONAUTICS BOARD, WASHINGTON, D. C.

CIVIL AIR REGULATIONS

PART 29—PHYSICAL STANDARDS FOR AIRMEN

As amended to October 1, 1949

Sec.
29.1 Physical standards.
29.2 First class
29.3 Second class.
29.4 Third class.
29.5 Waiver of physical standards.

AUTHORITY: §§ 29.1 to 29.5 issued under sec. 205 (a), 52 Stat. 984; 49 U. S. C. 425 (a). Interpret or apply secs. 601, 602, 52 Stat. 1007, 1008; 49 U. S. C. 551, 552.

SOURCE: §§ 29.1 to 29.5 contained in Amendment 29–0, Civil Air Regulations, 7. R. F. 3925, except as noted following sections affected.

§ 29.1 *Physical standards.* The physical standards for airmen shall be as set forth in §§ 29.2–29.4.

§ 29.2 *First class*—(a) *Eye.* Applicant shall have:

(1) A visual acuity of at least 20/20 in each eye separately without correction: *Provided,* That if the vision in either or both eyes is not poorer than 20/50 and is brought up to 20/20 or better in each such eye by glasses, the applicant may be qualified upon condition that correcting glasses be worn while exercising the privileges of his airman certificate.

(2) An average depth perception of 30 millimeters or less on a prescribed depth perception apparatus with or without correction: *Provided,* That if the depth perception is greater than 30 millimeters without correction, and is corrected to at least 30 millimeters average by glasses, the applicant may be qualified upon condition that such glasses be worn while exercising the privileges of his airman certificate.

(3) No diplopia in any meridian within 35 degrees from the point of visual fixation.

(4) Not more than one diopter of hyperphoria in either eye.

(5) Not more than 10 diopters of esophoria.

(6) Not more than 5 diopters of exophoria.

(7) An abduction of not less than 3 diopters nor more than 15 diopters.

(8) An adduction of 6 or more diopters.

(9) An accommodation of at least V=1.00 at 18 inches with each eye separately without the use of correcting glasses.

(10) Normal color vision.

(11) Normal visual fields.

(12) No acute or chronic pathological condition of either eye or adenexae, which may interfere with its proper function, may progress to that degree, or may be aggravated by flying.

(b) *Ear, nose, throat, and equilibrium.* (1) Applicant shall be able to hear the whispered voice at 8 feet with each ear separately; shall have no acute or chronic disease of the middle or internal ear; no disease of the mastoid; no unhealed (unclosed) perforations of the ear drum; no disease or malformation of the nose or throat which may interfere with or be aggravated by flying; and no disturbance of equilibrium.

(2) If the hearing acuity for the whispered voice is less than 20 feet in either ear the applicant shall possess a hearing acuity of at least 50% of normal in each ear throughout the effective speech and radio range as demonstrated by a standard audiometer.

(c) *General physical condition.* (1) Applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe piloting of aircraft, or other duties of his airman certificate.

(2) Reclining blood pressure shall not exceed 135 mm. systolic, nor 90 mm., diastolic.

(3) Applicants 40 years of age or over shall demonstrate a degree of circulatory efficiency compatible with the safe operation of aircraft at high altitudes.

(d) *Nervous system.* Applicant shall have no disease of the mental or nervous system and no abnormality of the personality.

§ 29.3 *Second class*—(a) *Eye.* Applicant shall have:

(1) A visual acuity of at least 20/20 in each eye separately without correction: *Provided*, That if the vision in either or both eyes is not poorer than 20/50 and is brought up to 20/20 or better in each such eye by glasses, the applicant may be qualified upon condition that correcting glasses be worn while exercising the privileges of his airman certificate.

(2) An average depth perception of 30 millimeters or less on a prescribed depth perception apparatus, with or without correction: *Provided*, That if the depth perception is greater than 30 millimeters without correction, and is corrected to at least 30 millimeters average by glasses, the applicant may be qualified upon condition that such glasses be worn while exercising the privileges of his airman certificate.

(3) No diplopia in any meridian within 35 degrees from the point of visual fixation.

(4) Not more than one diopter of hyperphoria.

(5) Properly balanced eye muscles with an abduction of 3 diopters or more, and adduction of six diopters or more.

(6) Sufficient accommodation to pass a test prescribed by the Administrator based primarily upon ability to read official aeronautical maps.

(7) Normal fields of vision; and

(8) No pathology of the eye.

(b) *Ear, nose, throat, and equilibrium.* Applicant shall be able to hear the whispered voice at 8 feet with each ear separately; shall have no acute or chronic disease of the middle or internal ear; no disease of the mastoid; no unhealed (unclosed) perforations of the ear drum; no disease or malformation of the nose or throat which may interfere with or be aggravated by flying; and no disturbance of equilibrium.

(c) *General physical condition.* Applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe piloting of aircraft, or other duties of his airman certificate.

(d) *Nervous system.* Applicant shall have no disease of the mental or nervous system and no abnormality of the personality.

§ 29.4. *Third class*—(a) *Eye.* Applicant shall have:

(1) A visual acuity of at least 20/50 in each eye separately without corrections: *Provided*, That if the vision in either or both eyes is poorer than 20/50 and is brought up to 20/30 or better in each such eye by glasses, the applicant may be qualified upon condition that such glasses be worn while exercising the privileges of his airman certificate.

(2) No serious pathology of the eye.

(b) *Ear, nose, throat, and equilibrium.* Applicant shall be able to hear the whispered voice at 3 feet; shall have no acute or chronic disease of the internal ear, no disease or malformation of the nose or throat which may interfere with or be aggravated by flying, and no disturbance in equilibrium.

(c) *General physical condition.* No applicant shall have an organic or functional disease which would interfere with the safe piloting of aircraft, or other duties of his airman certificate. Any structural defect or limitation shall be noted on the medical certificate.

(d) *Nervous system.* Applicant shall have no disease of the mental or nervous system and no abnormality of the personality.

[Amdt. 29–0, 7 F. R. 3925, as amended by Amdt. 29–2, 9 F. R. 11675, Amdt. 29–3, 10 F. R. 3795]

§ 29.5 *Waiver of physical standards.* An airman certificate shall be issued to an applicant, other than an applicant for the original issuance of an airline transport pilot certificate, who does not meet the appropriate physical standards if his aeronautical experience, ability, and judgment compensate for his physical deficiency and he meets all other requirements for the issuance of said certificate. Any certificate issued under these circumstances shall state that the applicant does not meet the appropriate physical standards prescribed herein but that his physical deficiencies were found to be compensated by his demonstrated aeronautical experience, ability, and judgment. Such certificate may be limited as to type of operation, type of aircraft, or period of reexamination.

[Amdt. 29–1, 8 F. R. 16888]

CIVIL AERONAUTICS BOARD, WASHINGTON, D. C.

Civil Air Regulations Amendment 29–1—Effective: December 21, 1949; Adopted: December 21, 1949

WAIVER OF PHYSICAL REQUIREMENTS FOR AIRLINE TRANSPORT PILOTS

Part 29 currently provides that an airman certificate shall be issued to an applicant other than an applicant for the original issuance of an airline transport pilot certificate who does not meet the appropriate physical standards if his aeronautical experience, ability, and judgment compensate for his physical deficiency and he meets all other requirements for the issuance of such certificate.

This amendment provides for the original issuance of airline transport pilot certificates to applicants who do not meet the appropriate physical standards for the issuance of such certificates, but who meet all other certificate requirements, and whose airman operational experience, ability, and judgment compensate for their physical deficiency.

In this connection it should be noted that under current regulations an airline transport pilot can acquire a physical disability after the original issuance of his airline transport pilot rating, and if he is able to compensate for such deficiency, be eligible to continue to exercise the privileges of such rating. However, had such an individual acquired this same deficiency prior to the original issuance of the rating, he would not, under current regulations, be able to obtain it. The Board does not at this time believe that there is any sound reason for this distinction.

This amendment is necessary at this time for the following reason. Part 42, as revised, requires that all pilots serving as pilots in command of large aircraft in irregular air carrier operations shall, after December 31, 1949, possess valid airline transport pilot ratings. Prior to such revision pilots operating under Part 42 were required to hold only a commercial rating which may be obtained even though an applicant is unable to meet all of the prescribed physical standards for the issuance of such rating. We have been advised that several pilots, employed for considerable periods of time as pilots in command of large aircraft operated by irregular air carriers, are unable to meet the physical requirements for the original issuance of airline transport pilot certificates. Under current regulations these pilots would not be able to continue in their employment, even though it may be shown that they can competently and safely perform their duties. It is believed that there are a number of pilots whose operational experience, ability, and judgment justify the issuance of airline transport ratings even though they may not fully meet the physical standards for the original issuance of an airline transport pilot certificate. This amendment will enable such pilots to obtain airline transport pilot certificates.

In addition, this amendment clarifies the meaning of the phrase "aeronautical experience" as currently used in § 29.5. That phrase has been interpreted as having the same connotation when used in that section as when used in the airman certification parts of the Civil Air Regulations, that is, to mean merely the specified total number of flying hours or years of experience required to obtain an airman certificate. However, such phrase, for the purposes of § 29.5, should be interpreted as including an evaluation and finding by the Administrator of the quality of the applicant's past performance as an airman to determine whether he is competent to perform safely the duties of the airman certificate applied for, notwithstanding his physical deficiency. Accordingly, the phrase "operational record as an airman" is substituted for the phrase "aeronautical experience."

This amendment does not require the airman certificate issued to a pilot not meeting the prescribed physical standards to be endorsed as currently prescribed. We have been advised by the Administrator of Civil Aeronautics that in his opinion such an endorsement is unnecessary to insure that holders of airman certificates perform safely the duties authorized by such certificates, and therefore this requirement imposes an unnecessary administrative burden upon his staff. The Board concurs in the Administrator's opinion in this regard.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all relevant matter presented. For the reasons stated above, and since this amendment imposes no additional burden on any person, the Board finds that good cause exists for making this amendment effective on less than 30 days' notice.

In consideration of the foregoing the Civil Aeronautics Board hereby amends Part 29 of the Civil Air Regulations (14 CFR, Part 29, as amended) effective immediately:

By amending § 29.5 to read as follows:

29.5 *Waiver of physical standards.* An airman certificate shall be issued to an applicant who does not meet the appropriate physical standards if the Administrator finds that the applicant's operational record, ability, and judgment as an airman compensate for his physical deficiency and he meets all other requirements for the issuance of said certificate. Such certificate may be limited as to type of operation, type of aircraft, or period of reexamination.

[Sec. 205 (a), 52 Stat. 984, 49 U. S. C. 425 (a). Interpret or apply secs. 601 and 602, 52 Stat. 1007 and 1008; 62 Stat. 1216; 49 U. S. C. 551 and 552; Act of July 1, 1948.]

By the Civil Aeronautics Board:

[SEAL] M. C. MULLIGAN, *Secretary.*

UNITED STATES OF AMERICA, CIVIL AERONAUTICS BOARD, WASHINGTON, D. C.

Civil Air Regulations Amendment 29-2—Effective, March 20, 1951; adopted, February 13, 1951

COLOR VISION, NEAR VISION, AND BLOOD PRESSURE REQUIREMENTS FOR AIRMEN

Part 29 currently established physical standards of the first, second, and third class. One of the first-class standards, which are currently required to be met only by applications for airline transport pilot rating, is that the individual shall have normal color vision. Applications required to meet the second-class standards are required to have "normal fields of vision," which has been interpreted as requiring those applicants to have normal color vision. Commercial pilots, flight navigators, and flight engineers are currently required by Parts 20, 22, 34, and 35 to meet the second-class physical standards. The third-class physical standards, currently required by Parts 20, 22, and 33, respectively, to be met by student and private pilots, free balloon pilots, and flight radio operators, include no color vision requirements.

The amendments now being promulgated require individuals being examined in accordance with the second and third-class medical standards to recognize aviation signal red, aviation signal green, and white. They become applicable to current holders of airman certificates at the time they apply for renewal of their medical authorizations. In the event that such an individual is unable to distinguish those aviation colors, he is required to demonstrate to an authorized representatives of the Administrator his ability to interpret such signals under conditions usually encountered by an airman. If the individual can pass such a practical examination, he will be issued a waiver and will then become eligible for the issuance of an airman certificate. It is anticipated that this color vision examination will be administered by the physician conducting the physical examination. However, if the physician does not have the equipment to conduct this test, it is also anticipated that the Administration will provide a means whereby such individual can take the aviation signal color test. In these latter instances it is believed that the test can be administered without requiring the individual to incur the expense of accomplishing a flight test to determine his ability to distinguish aviation colors. Only where the individual cannot distinguish such colors should he be required to undergo a flight test. Then, if he can accomplish the flight test, he will be issued a waiver. In each case of the issuance of a waiver based upon the practical examination, the individual will not thereafter be required to retake that examination.

When the individual cannot meet the proposed color vision requirements, including the practical examination, he can be issued an airman certificate, but such certificate will be appropriately endorsed to prohibit the exercise of the privileges authorized by the airman certificate except under conditions, or with the use of equipment, such as two-way radio, which would not require the ability to distinguish aviation signal colors. For example, a pilot who is unable to meet the color vision requirements in any way may be authorized to fly only with two-way radio communications available or under conditions where aviation lights would not be used for communication.

It will be noted that Annex 1 to the Convention on International Civil Aviation contains medical recommended practices which provide that the above-men-

tioned airmen be able to distinguish aviation signal red, aviation signal green, and white.

In addition, the near vision requirements of Part 29 are being amended to establish the use of correcting lenses as an alternate to meeting requirements by natural vision. This will permit an individual to meet the first-class physical standards without issuance of a formal waiver as is currently the case.

Part 29, § 29.2 (c) (2), prescribes that reclining blood pressure shall not exceed 135 mm. systolic, nor 90 mm. diastolic, for the first-class physical standard which at present applicants for airline transport pilot ratings are required to meet. The amendment hereby adopted eliminates this general restriction and establishes instead specific limitations based upon age, with limited adjustments where the results of a complete cardiovascular examination are shown to be normal.

The new limitations give recognition to the normal tendency of blood pressure to increase with age, and, in their operation, would allow the pressure readings of an applicant to be slightly above the limits set for his age if, in effect, examination shows no evidence of heart disease. It is believed that this change in the regulation would, consistent with safety, permit trained personnel to fly at advanced ages with more effective utilization of their experience, and would afford more meaningful data for research and statistical purposes.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all relevant matter presented.

In consideration of the foregoing the Civil Aeronautics Board hereby amends Part 29 of the Civil Air Regulations (14 CFR, Part 29, as amended), effective March 20, 1951:

1. By amending § 29.2 (a) (9) to read as follows:

29.2 First class. * * *

(a) *Eye.* * * *

(9) A near vision of at least v=1.00 at 18 inches with each eye separately without the use of correcting lenses: *Provided*, That if near vision in either or both eyes is poorer than v=1.00 at 18 inches the applicant shall possess the necessary correcting lenses.

2. By amending § 29.2 (c) (2) to read as follows:

29.2 First class. * * *

(c) *General physical condition.* * * *

(2) Unless the adjusted maximum readings apply, applicant's reclining blood pressure shall not exceed the maximum readings for his age group, as indicated in the table shown on page 3. The adjusted maximum readings shall apply to any applicant, age 30 years or more, whose reclining blood pressure exceeds the maximum readings for his age group and whose cardiac and kidney conditions, after complete cardiovascular examination, are shown to be normal.

Age group	Maximum readings (reclining blood pressure in mm.)		Adjusted maximum readings (reclining blood pressure in mm.)	
	Systolic	Diastolic	Systolic	Diastolic
20 to 29	140	88		
30 to 39	145	92	155	98
40 to 49	155	96	165	100
50 and over	160	98	170	100

3. By adding a new § 29.3 (a) (9) to read as follows:

29.3 Second class.

(a) *Eye.* * * *

(9) The ability to distinguish aviation signal red, aviation signal green, and white.

4. By adding a new § 29.4 (a) (3) to read as follows:

29.4 Third class.

(a) *Eye.* * * *

(3) The ability to distinguish aviation signal red, aviation signal green, and white.

5. By amending § 29.5 to read as follows:

29.5 Waiver of physical standards.

(a) An airman certificate shall be issued to an applicant who does not meet the appropriate physical standards if the Administrator finds that the applicant's operational record, ability, and judgment as an airman compensate for his physical deficiency and he meets all other requirements for the issuance of said certificate. Such certificate may be limited as to type of operation, type of aircraft, or period of reexamination.

(b) Where the Administrator's finding regarding an individual's ability and judgment as an airman is based upon a practical test, that individual will not be required to retake such practical test during subsequent physical examinations unless, in the opinion of the Administrator, the individual's physical deficiency has become more pronounced.

[Sec. 205 (a), 52 Stat. 984; 49 U. S. C. 425 (a). Interpret or apply secs. 601, 602, 52 Stat. 1007, 1008, 62 Stat. 1216; 49 U. S. C. 551, 552, Act of July 1, 1948.]

By the Civil Aeronautics Board:

[SEAL] M. C. MULLIGAN, *Secretary.*

Senator MONRONEY. Dr. King? Will you state your name for the record and state your position with the CAA?

STATEMENT OF DR. BARRY KING, CIVIL AERONAUTICS ADMINISTRATION, RESEARCH EXECUTIVE, MEDICAL DIVISION

Dr. KING. I am Barry King, Civil Aeronautics Administration, Research Executive, Medical Division.

Senator MONRONEY. Dr. King, you were here this morning when we heard some testimony, particularly by Dr. Ashe of Ohio State, and by Mr. Pyle, the Administrator. The committee is not quite clear exactly as to all that the research center does, what it is comprised of, and we would like to have you clarify that, if you will.

Dr. KING. We have a rental agreement with the Ohio State University for the rental of a small building in which we house our research laboratory. We have a less tangible but an invaluable asset in the association with the faculty of the Ohio State University.

We have no money, they are not under contract, they receive no money for carrying out research directives for the Civil Aeronautics Administration. So they are not essentially under research contract. But this is in association with research scientists and experts, and we rely upon them for forwarding our education and training program, and work with them as we do with Harvard and UCLA.

Senator MONRONEY. Do you have programs at Harvard and UCLA on a contract basis?

Dr. KING. No; we have no contract with any university.

Senator MONRONEY. You work with them but that is only done because they have courses in aviation medicine?

Dr. KING. We go around and encourage them and try to supply information. It is a matter of stimulating, encouraging them in their educational activities.

Senator MONRONEY. In other words, the more universities that are teaching aeromedicine the better off you think your work will be along this line?

Dr. KING. Yes, sir.

Senator MONRONEY. And you can't do it all. All you can do is just stimulate it and expect, aside from the few projects, the universities to come up with these courses.

Dr. KING. In the educational field. We believe that to be the function of the university, especially medical education and training. At our research laboratory we are currently conducting, either there or here, approximately 15 projects. Three of these are in collaboration with the military services, who have been very kind in helping and allowing us to use some of their facilities.

Senator MONRONEY. Is there as wide as possible an interchange between the military services and CAA work in this regard?

Dr. KING. Yes, sir. We exchange reports, as General Byrnes said. We will frequently work on a project or a portion of a project together and we meet at the working level for the exchange of information. We are at Wright Field and they are at our place, and we work very closely together, also, with the Navy.

Senator MONRONEY. Under this bill, which I am sure you read, the part of the CAA in promoting and in trying to learn more and more about aviation medicine is greatly stepped up, isn't it?

Dr. KING. Yes, sir.

Senator MONRONEY. Do you favor that increase?

Dr. KING. We have a great many problems to solve in civil aviation. We are going to have to find some way to do it. The industry is working along in their departments.

Senator MONRONEY. By the industry do you mean the airlines and aircraft manufacturers?

Dr. KING. The aircraft manufacturers and the Government, and we have the problem of determining whether some of their proposed solutions will adequately meet the purpose intended, and we also exchange information which will help them on problems of a noncompetitive nature and interest. And we have many, many problems to meet in the relatively near future.

Senator MONRONEY. It requires a broad program: Post-graduate training courses in civil aviation medicine—the CAA is supposed to do that—to participate in the investigation of civil aircraft accidents, and where indicated require physical examination or autopsy of passengers and crew involved; and to establish and maintain research fellowships; to collect, tabulate, and analyze pertinent data pertaining to medical aspects of accidents in air commerce, physical condition of airmen, and such other subjects as may provide guidance in establishing sound medical regulations and directives, and issue period statistical summaries and reports embodying the findings obtained.

All of these things would require a pretty considerable establishment in the office of the Civil Air Surgeon; would it not?

Dr. KING. They require research facilities and research staff. I don't know about the organization.

Senator MONRONEY. You think it could be done by universities on a basis such as has been done by the Army and Navy? Or Air Force and Navy?

Dr. KING. May I speak to that point?

Senator MONRONEY. Yes.

Dr. KING. I have worked with the Office of Naval Research and I have had contractual relations with the research and development of the Air Force and the Army, and I am on several of their advisory boards. The policy generally is that there are some projects which

must be carried out intramurally. One of the reasons for that is that we have to have people who are immediately familiar with the problems, so that they can interpret and advise and develop human requirement specifications.

There are other projects which universities are far more suited to do and carry out. All of these organizations, for example the Navy, as you have heard this morning, has the facility at Pensacola. They have one at AMC, Philadelphia; at the Johnsville Submarine Base, from which we get some of our information on aviation.

In addition to this, the Office of Naval Research carries out a contractual program. This is where we get contract research carried out by universities for military purposes. We feel that we will have to have some help from universities on special problems where they are best suited to do this. We believe that we should assist in encouraging at least the educational program so that industry can bear a greater part of its responsibility.

In the last 3 years there has been a fivefold increase in the attention of industry to the human-factors problems. They now have some 207 people in the 41 industries which were surveyed, working on these problems, and they are unable to take on a greater share of the burden because of the lack of trained people in this field.

Senator MONRONEY. Senator Schoeppel?

Senator SCHOEPPEL. I have no questions.

Senator MONRONEY. Mr. Pyle, the Administrator, testified as to a course at Ohio State University, where a 3-year course is now being given.

Dr. KING. Yes, sir. That is correct.

We have three residencies, one of which is set up and paid for by the Airline Pilots Association for a medical residency for specialty in aviation medicine, and the other residency is set up and partially paid for by the Link Foundation, who are supporting that. There is no monetary exchange for this training. We participate in some of the teaching and help where our technical people are acceptable to the university on a university standpoint.

Mr. BAYNTON. There is no volume there. It is a very limited training, limited numbers?

Dr. KING. That is correct. The other is a refresher course which has 25 to 35 people and that is given once a year. That is a week's course.

Senator MONRONEY. Dr. King, thank you very much. Do you have any other statement that you would like to make?

Dr. KING. No, sir. If the committee would be interested we would be very happy to submit a list of publications and industry utilization of these data to give you a better idea of what our program is.

Senator MONRONEY. That would b every helpful. Thank you very much, Dr. King.

We have only two witnesses listed here for tomorrow morning, I believe. We could hear them now. The three remaining witnesses that we could hear this afternoon are not here.

Consequently, the committee will stand in recess until 10 o'clock tomorrow, at which time we will meet in room F–39.

(Thereupon, the subcommittee was adjourned at 3:50 p. m., to reconvene at 10 a. m., April 2, 1957.)

CIVIL AVIATION MEDICINE

TUESDAY, APRIL 2, 1957

UNITED STATES SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D. C.

The subcommittee met, at 10:20 a. m., in room F–39, United States Capitol, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation of the Senate Interstate and Foreign Commerce Committee will resume its hearings on the bill, S. 1045, to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto a new provision relating to civil aviation medicine.

We are pleased to have Dr. Herbert F. Fenwick, doctor of medicine, president of Civil Aviation Medical Association present to testify this morning.

Doctor, will you come forward and you have a prepared statement, sir?

Dr. FENWICK. Yes, sir.

Senator MONRONEY. No copies are available though?

Dr. FENWICK. No, sir.

Senator MONRONEY. Doctor, we are glad to have you here and you may proceed in your own way to tell us about your views.

STATEMENT OF HERBERT F. FENWICK, M. D., PRESIDENT, CIVIL AVIATION MEDICAL ASSOCIATION, ACCOMPANIED BY JOEL FISHER, COUNSEL

Dr. FENWICK. Thank you, sir.

Mr. Chairman, the Civil Aviation Medical Association appreciates very much this opportunity to present its view on S. 1045, the bill you are considering today.

We believe this bill is designed to improve safety in air commerce through the development and application of sound medical knowledge and would establish a new office in the Civil Aeronautics Administration to develop medical requirements and evaluate the physical fitness of airmen.

This office, headed by a civil air surgeon, would be authorized to create and equip an aviation medical laboratory which would be equivalent in civil aviation medicine to the medical research and development facilities of the Armed Forces and would promote the development of technical medical information.

Our association was formerly known as the Airline Medical Examiners Association. Our membership consists mainly of the nearly

1,800 designated medical examiners of the Administrator of Civil Aeronautics who are charged with the responsibility of periodically assessing the physical fitness of the 280,000 active civilian airmen.

Here I thought it might be a good idea to insert a few words concerning my own background in aviation medicine and aviation, figuring it might be helpful to the committee.

Senator MONRONEY. Your organization largely represents the examiners that are working for the airlines themselves?

Dr. FENWICK. No, sir; those that are working for the Civil Aeronautics Administration, as designated medical examiners.

Senator MONRONEY. Do you include in your membership the physicians and staff members of airline medical departments?

Dr. FENWICK. Yes, sir; if they want to be members, yes.

Senator MONRONEY. You do not know the percentage or how they relate to your total membership?

Dr. FENWICK. Well, of course the airline medical directors naturally there would not be nearly as many. Now, I can—just offhand that I know of we have three. Just how many their actual membership is I do not know, but it probably would not be much over 35 or 40, I would not think, sir.

Getting back to my own background there which was very brief. I was a pilot in World War I and have a commercial license which I have held for many years. I have flown military and civilian aircraft since 1917 and now I am lucky enough to have 2,200 solo hours. I graduated as a flight surgeon from the Air Corps School of Aviation Medicine in 1930 at which time I was medical officer for the 180 Observation Squadron of the Illinois National Guard. I have been a designated medical examiner of airline transport pilots for the Civil Aeronautics Administration since February of 1930. At present I am a practicing physician in Chicago specializing in aviation medicine. For many years I have served as consultant in aviation medicine to several major airlines and to the Airline Pilots Association. I served as a flight surgeon and base surgeon with the Army Air Force in World War II. I am a diplomate in aviation medicine of the American Board of Preventive Medicine and a fellow and past president of the Aero-Medical Association.

Since designated medical examiners of the Administrator of the Civil Aeronautics Administration are in a position to observe inadequacies that may exist in the Administrator's medical program and must be governed by his policies and the procedures promulgated by him through his medical division, we in the interest of public safety find it necessary to enumerate these conditions.

Certainly we are only too well aware of the limited facilities at his command and the relative importance that he must attach to his various responsibilities in order to keep the overall program within budgetary allowances. Nevertheless, in the belief that the strengthening of aviation medical policy will add much to the development of civil aviation and be the means of saving lives and property through the reduction of aircraft accidents we are using the opportunity afforded to bring this matter sharply into focus. We believe these inadequacies are:

1. Lack of authority for final decision on medical questions. For instance, I have been informed that there have been cases where doctors

in the field and even the medical department of the CAA have turned a pilot down in his application for a flying license but later on that decision was reversed and he was allowed to fly without any further medical consultation.

Senator MONRONEY. You mean that—of course all pilots are entitled to an appeal and a reexamination. But do you mean to tell me that this pilot was not even reexamined, that they just overrode the medical examiner?

Dr. FENWICK. I am informed that that is the way it has been; yes, sir.

Senator MONRONEY. Was he a transport pilot or what?

Dr. FENWICK. Well, there have been instances of all types, mainly I would say private, however.

Senator MONRONEY. But would you say that it is certainly not customary to override the medical findings of an examiner without doing it on the basis of further medical information?

Dr. FENWICK. It has been done, sir.

Senator MONRONEY. It has?

Dr. FENWICK. It has been done; yes, sir.

Senator MONRONEY. You may proceed.

Dr. FENWICK. No. 2 is the ill-defined standards of physical fitness. I will have a little more to say about that later on in the paper.

3. An inadequate selection, training, and supervision of medical examiners: There is nothing in the form of training for newly appointed medical examiners except one civilian course at the Ohio State University which, of course, cannot in any way fulfill the adequate needs of all. For instance, we have over 1,800 medical examiners at this time.

4. No provision for specialist consultation: In that we mean that if I or any other medical examiner desired the consultation of a heart specialist or a diabetic specialist or an eye specialist, there is no one that we can turn to in the Department; and that is another place where we feel that this new act, by creating a civil air surgeon, would result in him having these consultants available.

Senator MONRONEY. He would have a list of them, you mean? He would not keep a lot of specialists on cancer or heart or all on the payroll?

Dr. FENWICK. No, sir.

Senator MONRONEY. But he would have a list of authorities and could have them checked in that way?

Dr. FENWICK. Yes, sir; that is what we meant.

5. Lack of research and training facilities for development of medical technical knowledge for teaching of civilian aviation medicine to medical designees: That is very similar to what I just said.

Senator MONRONEY. About the lack of research. Will you read that again, please?

Dr. FENWICK. Yes, sir.

Lack of research and training facilities for development of medical technical knowledge for teaching of civilian aviation medicine to medical designees.

Senator MONRONEY. Do you not think, Doctor, that finally most of this will have to be done, perhaps even though some of it is done with grant aid, by our medical universities, that we cannot have a big

enough setup in our own medical aviation group to provide for the teaching and training and all of the men who will be necessary to serve in this as medical examiners.

Dr. FENWICK. Well, I do not believe that the Department itself should train each man actually to become the flight surgeon, but I do believe they should have a little more information for him when he is first appointed as an examiner. So many times he does not know for sure exactly what he is doing, in spite of the fact that a written statement goes out from the medical department advising him of his duties, and so on. But there is no man to send out there. If we only had a few extra doctors we could send out there and teach this man.

Senator MONRONEY. Break him in, give him a check flight on whether he can understand all the things that he should do?

Dr. FENWICK. In other words, he should have a check flight, that is what he should have, sir.

7. No provision for direct medical participation in aircraft-accident investigation or for physical examination and/or autopsy of pilots or passengers involved in aircraft accidents. That speaks for itself.

Senator MONRONEY. Could you get much out of an autopsy after a crash? I mean, you have your two pilots and if they were alive, of course, why you could give them a physical examination as a result of the accident, but in the event of death in the crash, well, usually their bodies are so badly destroyed or mangled that I would not think your autopsy would ever show anything.

Dr. FENWICK. In many instances a pretty badly burned body would show plenty. For instance, often the internal organs are not so badly destroyed but a good pathologist can locate the cause of death, and in a few instances they found a coronary clot in the heart. So we knew the pilot died before the crash. So the autopsy would be very valuable in assessing all of the—in other words, all of this and the causes of aircraft accidents.

Senator MONRONEY. Have you had any figures there based on the experience of your group with regard to the relationship of failure of pilots' health to aircraft accidents?

Dr. FENWICK. I do not have any exact figures now. The attorney for the association might possibly have those. He is here if you wanted to ask him. Mr. Fisher.

Senator MONRONEY. Is Mr. Fisher here?

Mr. FISHER. Yes, I am here, Mr. Chairman.

I believe you have reference to that later in your statement.

Dr. FENWICK. Well, that is brought out; yes, sir.

Senator MONRONEY. Why do you not go ahead and proceed?

Dr. FENWICK. I am sorry, sir; that is brought out.

8. Inability of medical personnel to maintain correspondence with pilots and designated medical examiners for providing medical information requested by the profession and in the aviation industry.

Of course, what we mean there is not just a good method of disseminating medical—let us say aviation medical knowledge.

Our association strongly favors the early enactment of S. 1045 and we believe it will provide the corrective measures needed to meet these inadequacies.

A review of the Civil Aeronautics Act of 1938, as amended, reveals the Federal medical responsibility in the safety of aviation is more

implicit than explicit and as a result the medical profession has not been in a position to contribute on any firm and regular basis from its vast knowledge on this most important subject.

Authority for the Civil Aeronautics Administrator's medical program, including the Civil Aeronautics Board regulations, governing the physical fitness and medical certification of civilian airmen is based on such fragmentary phrasing as "physically able to perform," "tests of physical fitness," "to promote safety of flying," "minimum standards," "maximum hours or periods of service of airmen," "reasonable rules and regulations," and "minimum methods or standards governing other practices."

Now, in exploring the reason for such vague medical authority we understand from those who participated in the drafting of the act and its subsequent amendments that there was little medical advice available to assist in a proper phraseology. One participant advised that had he then had the knowledge of the importance of aviation medicine to aviation safety that he has since acquired he most assuredly would have insisted on more definite medical requirements in the original act.

Aviation medicine which was still in comparative infancy in 1938 has now developed to a status where it is internationally recognized as an important medical specialty and is accorded the same status in this country as is given to other medical specialties. The importance of aviation medicine has been recognized by the United States Air Force and the United States Navy which have established offices of the Surgeon General and the Chief of Aviation and Operational Medicine both of which are far in advance of any civil air medical office or position.

There is no civilian counterpart to these offices and until the Congress indicates by clear legislation like S. 1045 that the knowledge and assistance of aviation medicine must be taken into account in civil aviation we feel that there is a serious hindrance to our effort to make aviation safe.

We in civilian aviation medicine are shocked at the lack of research which exists in this field. As doctors examining pilots we know the physical standards are now archaic and are no longer adequate. We find that pilots of all classes are being passed who in some cases we do not believe should be flying. Yet, under the present regulations and the practice it is impossible to disqualify all of these pilots.

Senator MONRONEY. Will you elaborate on that, doctor, because I think that is a very serious charge if they are passing transport pilots who should not be passed and I think you would do the committee a very great favor by being quite specific on that point on how these men are being okayed, is it the fault of the rules of the medical division of the CAA that they are slipping through?

Dr. FENWICK. I would like to qualify that. In general that would not apply to airline transport pilots.

Senator MONRONEY. I see.

Dr FENWICK. Because airline transport pilots are really held down to the requirement.

Senator MONRONEY. They almost have to live to the very ultimate letter of physical perfection, do they not?

Dr. FENWICK. Yes, sir.

Senator MONRONEY. Because of the large number of passengers that must rely upon them for safety.

Dr. FENWICK. That is right, sir; too many innocent people are flying behind them.

Senator MONRONEY. So, what you have to say does not relate to the examination of the commercial airline pilots?

Dr. FENWICK. No, sir; I do not believe it applies to them at all. I plainly had in mind again private pilots.

Senator MONRONEY. Does this apply to class 2 pilots?

Dr. FENWICK. Probably, but not in such great number. We are concerned greatly with this private pilot thing for the simple reason this private pilot thing for the simple reason this private pilot uses the same airspace as the airline transport pilot.

Now, he can fly into the side of a jet airliner, if he can't see right; he can fall on top of one, if he has a heart attack or coma from diabetes; he is just as important in the air as the airline transport pilot from the standpoint of public safety.

Now, the jet age, finishing up that last statement, the jet age is now upon us and the physical and mental fitness of the pilot is more important than ever before due to these great increased speeds and the strain and so forth on the pilot. When he approaches another airplane at 550 miles an hour it is a lot different than 250 miles an hour. Of course, if 2 of them are coming together at 550 I don't have to tell you what will happen.

Here are the figures that you asked for, Mr. Chairman.

We are aware of the statistics that four-fifths of all aircraft accidents are attributed to the element of human failure and we are convinced that proper medical assessment and physical and mental fitness and physical mental capabilities of airmen in the various age groups which constitute the pilot population will effectively reduce the proportion of air accidents which are attributable to the human element.

Senator MONRONEY. In other words, the four-fifths figure does not mean that that many are attributable to medical defects or disability?

Dr. FENWICK. No, sir.

Senator MONRONEY. It means that they are perhaps the result of not being up to the ultimate on performance of the job and then maybe the decision is wrong when you get into a tight spot or something like that, and so the accident occurs. And the best examination in the world would not substantially reduce the four-fifths figure, would it?

Dr. FENWICK. I believe so.

Senator MONRONEY. You think it would?

Dr. FENWICK. Yes, I believe so.

Senator MONRONEY. In what way?

Dr. FENWICK. Especially again getting right back to that private pilot, you see. Getting back to that private pilot because it is among the private pilots and in the private flying, of course, where the great majority of accidents are. I cannot give you the figures, but that is—I do not have them here.

Senator MONRONEY. Of course, a great many private planes, that is, a greater number of private planes are in the air than there are transport planes?

Dr. FENWICK. Yes, sir; that is right.

Senator MONRONEY. And consequently if you fly more planes you are apt to have more accidents, but I just was wondering, that four-fifths would apply, you think, more materially to your private flying

than it would to your airline accidents as well? Of course, an awful lot of those are listed as pilot error or human failure.

Dr. FENWICK. Yes, sir. Actually I was meaning more private pilots, that is correct, sir.

Senator MONRONEY. All right, you may proceed.

Dr. FENWICK. We feel that S. 1045 will establish the research facilities which are so urgently needed to provide the proper standards which we can use in our examination of pilots. We strongly disagree with the testimony of the Administrator of Civil Aeronautics when he implies that the study by the Flight Safety Foundation and the research projects of Ohio State University are definitive and such far-reaching studies in the field of aviation medicine. We class these as good first steps, but we believe, however, that the only way we can attack the problem of research is to establish a research facility of the type enumerated in this bill, S. 1045.

We also believe that S. 1045 provides a proper organizational structure insuring that medical opinion will prevail on purely medical questions.

In addition, we believe that such an organization within the Civil Aeronautics Administration would do much to improve the quality and character of medical examinations. At present CAA medical certification is withheld from less than 1 percent of pilot applicants drawn from a population in which 15 to 25 percent, depending on the class of medical certificate, could not qualify for a CAA medical certificate as has been shown by a study of Selective Service System medical examination findings.

Senator MONRONEY. Say that again—1 percent is disqualified, you say?

Dr. FENWICK. Yes, sir. Well, really we say that less than 1 percent, you see, are actually disqualified, whereas of course, the Selective Service System, I do not have those figures, the disqualification there, of course, as we all know, is very much greater.

Senator MONRONEY. You would not relate this 1 percent to the overall medical figure of the Selective Service, would you? Because most of these men, before they take up flying and before they get up to certification and licensing, well, they have pretty well been screened out of that 25 percent general that you speak of in the draft service, is that not true?

Dr. FENWICK. I do not believe that 25 percent meant the draft. I think the way we meant that was that about 15 percent of the higher type of pilot was disqualified whereas 25 percent of the private pilots—I should say probably should be disqualified—whereas 25 percent of the private pilots should be disqualified if we had the proper, stronger regulations.

Senator MONRONEY. Now, only 1 percent is disqualified?

Dr. FENWICK. Yes, sir; I got those figures——

Senator MONRONEY. Do you not think that was a bit high?

Dr. FENWICK. From our attorney, Mr. Chairman. Maybe our attorney could help me out on that.

Senator MONRONEY. I wish you would amplify that a little bit, this would be a very important part of the testimony, and yet it seems to me that you are relating the number of pilots that are not passed on examination which is perhaps 1 percent rejects to the 25 percent med-

ical rejects in the Selective Service as I understand the first reading.

Would you identify yourself for the record?

Mr. FISHER. Joel H. Fisher, practicing attorney, Washington, D. C., and counsel to the Civil Aviation Medical Association.

Senator MONRONEY. In other words, this is a very important part of the testimony because certainly everybody in aviation, private pilots, airlines, everyone else, wants to be sure that these examinations are performed in good order and that they do prohibit physically disqualified pilots from flying, and your organization represents, it is the only organization that represents these medical examiners, is it not?

Mr. FISHER. Yes, sir.

Mr. Chairman, it is certainly a fact that CAA medical certification records indicate that less than 1 percent of the pilots applying are disqualified, it is equally true that it is our view that it is a view actually of some of the speeches given by the Director of the CAA Medical Division that he did relate the Selective Service medical examination findings of 25 percent in the overall population to this problem and his byometric standards people at CAA, I believe, felt that there was some valid connection.

Now, you certainly seem to be taking issue with that, but that is what the statement means.

Senator MONRONEY. It means that while 25 percent were ruled out medically in the draft that only 1 percent——

Mr. FISHER. Less than 1 percent.

Senator MONRONEY. Well, I would think that in practice that of that 25 percent of our male population which were not admitted because of the draft, that most of those had been eliminated before you got up to taking that examination from your examiners, because they have to go through a flight training course before they are licensed.

Mr. FISHER. Well, that would certainly appear to be so, except that I do believe that in the next few paragraps of Dr. Fenwick's statement he will point out as to why examiners, for example, are not as prone to disqualify pilots. There is a moral factor among examiners, they do not feel they will be backed up. There was 1 point, Mr. Chairman, if I may——

Senator MONRONEY. Before you leave that. You say there is a morale factor.

Mr. FISHER. There is a morale problem among examiners. They feel they will not be backed up on these things at the CAB and I think that was implicit in one of the questions you raised before with Dr. Fenwick and I believe he will go forward on this but may I take a moment and elaborate?

Senator MONRONEY. Certainly.

Mr. FISHER. The procedure, I think, which was explained yesterday by the Director of Medical Division of CAA is that the designated examiner performs his examination; assuming he disqualified a man, the man then has his right of appeal on up through the regional surgeon and then on to CAA, Washington. Assuming CAA Washington still affirms the report below, as it were, the man then has a right of appeal to the CAB.

Now, when he has his right of appeal to the CAB he then comes forward with his own doctors who present the clinical picture as his advocates. The CAB has no requirement at all, that we know

of, that the findings of the designated examiner who, after all, represents the public interest, who has no particular monetary or other interests other than the public interest, there is no requirement, for example, that CAB give more credence or more effect to the designated examiner's report whereas, actually, what happens is that this hearing, here is a man with his doctors who say, "Well, we have examined him, we have known him since he's been a little boy, he seems all right to us." These may not be and usually are not aviation medical specialists, whereas the designated medical examiner there, now, his report is not taken into account other than his conclusion: I think this man is unfit to fly. Now, I think that was implicit in the question that you asked Dr. Fenwick a little earlier.

Senator MONRONEY. In other words, the basis of appeal is what you complain about, not that they deliberately override the medical examiner in the field, but that the appeal processes given under the regulations allows the applicant who has been turned down by the field examiner to come with a long list of specialists or somebody that says, "Well, this fellow is fit to fly."

Mr. FISHER. It is not the basis of appeal, it is the criteria, the weight that will be given to the conclusion of the designated medical examiner who, we feel of course, he and the CAA medical, who represent the public interest as against this man's private reason for wanting to fly.

Senator MONRONEY. Of course, you have the doctors for the appellant but you also have the report and the medical officer for the CAA, would you not?

Mr. FISHER. No, it does not work that way, sir. What we have in mind, of course, is the recent techniques that the courts have been using of having court psychiatrists in some of these domestic relations cases who come in and who examine for the court and their findings, their medical findings are findings that are final and they are subject to cross examination on both sides but this gets away from this long list of advocates coming up on all sides and literally swamping the courts with a number of experts and it is that kind of thing that we hope the procedure will improve.

Mr. BAYNTON. Mr. Fisher, you are in a sense saying that there should be a sort of what you might call a court-appointed surgeon at this stage of the game?

Mr. FISHER. Yes, sir; we think that the medical division of CAA broadened, for example, and given more funds, given some background and research, could very well perform that function along with this panel of consultants.

Senator MONRONEY. In other words, after you have the appeal the man will have his own doctors, but you will have another reexamination from the CAA air surgeon?

Mr. FISHER. That is right, sir; and then his doctors can talk to the impartial person and if they have any facts that want to bring to their attention, why, of course, they should be brought to this impartial panel's attention.

Senator MONRONEY. You may proceed, Doctor.

Dr. FENWICK. Thank you, sir.

There are at least three factors which account for this wide disparity in percentages.

First, is the failure of the examiners to report applicants who obviously do not meet the requirements. The association has completed a survey among the CAA-designated examiners. It appears to be the exception rather than the rule for examiners to report applicants who do not meet the physical standards, although administratively they are expected to do so.

A second factor is that examiners have grown somewhat contemptuous of the CAB actions in what examiners regard as a reversal of a medical opinion by a lay body so much so that they are reluctant to commit themselves against an applicant if they feel there is a possibility the applicant will obtain medical certification upon appeal to the CAB.

A third important reason for the failure of examiners to report adversely on applicants is the necessity under current regulations governing the general physical condition of applicants that a defect would interfere with the safe operation of aircraft. This should be brought into conformance with the requirements for eye, ear, nose, and throat examinations where it need be established only that the defect may interfere.

It is no more possible to state with certainty that a physical defect will suddenly incapacitate a pilot than it is to state at what point during a flight a cracked cylinder head will cause a motor failure.

An example of the type of regulation which the Civil Aeronautics Board, which has no medical staff or medical advisers, is proposing to make and which we feel is not based upon any scientific medical data whatsoever, was the recent proposal made by the Board to amend parts 29 and 43 relating to physical standards for airmen.

In these regulations the Board proposed to increase by as much as 200 percent in some instances the time span between the examinations. Rather than requiring more frequent examinations in order to insure that the pilots were in proper physical and mental condition the Board was proposing less frequent examinations.

In addition, the Board proposed serious reductions in standards relating to these examinations on pilots.

Senator MONRONEY. Will you excuse me there?

Dr. FENWICK. Yes, sir.

Senator MONRONEY. That was on the private pilots; was it?

Dr. FENWICK. No, sir; that was on all classes.

Senator MONRONEY. Two hundred percent increase in the time span. I thought that the airman had to be examined every 6 months.

Dr. FENWICK. That is the present regulation, sir; but this proposal would increase in the case of an airline transport pilot who now comes in every 6 months for a physical and mental appraisal, if he is under 40 years of age he could go for 2 years. If he was over 40 years of age, then he would have to come in once a year.

Now, in the case of a commercial pilot and, of course, a great majority of our copilots all start as commercial pilots, at the present time they come in once a year, every 12 months. Now, if they are under 40 they can go for 3 years without a physical, that was this proposal. This could go if the proposal became a law and if they were 40 years or over then they would have to come in once every 2 years.

I better tell you about private pilots. It is very interesting. Student and private pilots now only have to come in once every 2 years,

which we believe is way too long. Too many things can happen medically in 2 years. So the proposed regulation was if the pilot was under 40 years he could go 5 years, and if he was 40 years or over, then they would condescend to get him in once in 3 years.

Senator MONRONEY. That was circulated by the Medical Department——

Dr. FENWICK. No, sir; that was promulgated by the CAB, not the Medical Department, sir. The CAB has no medical department.

Senator MONRONEY. No; but they rely on the CAA to administer their air safety as it relates to medicine, and I was wondering if they had acted on that in regards to the decision of the medical officers of the CAA?

Dr. FENWICK. Let me ask.

Senator MONRONEY. Are the CAA doctors here. Is Dr. King here?

Mr. WOODWORTH. No.

Senator MONRONEY. Are you from the CAA?

Mr. WOODWORTH. Yes; I am one of the attorneys for CAA.

Senator MONRONEY. They are not going to have doctors represented today?

Mr. WOODWORTH. We can have them here on very short notice, Senator, if you would like to have them.

Senator MONRONEY. It is usually customary when you are dealing with legislation of importance to the agency; these men are here 1 day, for them to follow through to help us clarify testimony.

Mr. WOODWORTH. If you would like, I can call our office and I can have them here in 10 minutes. They had something very important. This is very important, vitally important.

Senator MONRONEY. They should have told us. That is all that is necessary. We do not care to take them off something else they are doing, but it seems like——

Mr. WOODWORTH. Would you like to have Dr. King or Dr. Stovall here?

Senator MONRONEY. I think somebody from CAA, maybe they can straighten this out for us.

Mr. FISHER. Mr. Chairman, perhaps I could help. I think this may help.

When these rules are circulated, these by the way are the same rules I understand Mr. Bakke said yesterday that the Board was going ahead to promulgate, our association, I believe the ALPA and the CAA came in and opposed these regulations in writing through the CAB and notwithstanding that, the CAB, we understand from Mr. Bakke's testimony yesterday, is proposing to promulgate them.

Senator MONRONEY. I do not recall specifically him saying this. I recall him stating some of the changes that have been made in the regulations and I asked him if that had a tendency to make easier the passage examinations and he said it did, but I did not understand that that had anything——

Mr. FISHER (interposing). This is hearsay to me and I have been told that he said this yesterday. Possibly wishful thinking.

Mr. BAYNTON. Mr. Chairman, there is a letter in our files now, written to you, where the Civil Aeronautics Board states in connection with these new standards and so forth that over 300 persons and organizations representing every branch of the aviation industry

and the medical profession responded to draft release 56–6, which I believe is the one you are mentioning, the comment was generally in the order of 3 to 1 in favor of each proposed change in the physical standards, but the response to the proposal to lengthening the period between physical examinations was about equally divided.

Mr. FISHER. Sir, we think, if we may say on that, the responsible agencies involved here, Aero-Med, CAMA, ALPA, the CAA itself, all were very strongly opposed to these.

Now, I do not know what else the CAB has been telling your committee but I am sure that statement of 50–50—that may be the number of communications in, but in terms of the segments of the industry I have very serious doubts.

Senator MONRONEY. I think we ought to have somebody from CAA down here to find out what their position was on this matter and if their medical department was consulted.

Mr. WOODWORTH. I will have them here right away.

Senator MONRONEY. You may proceed.

Dr. FENWICK. Thank you, sir.

I believe I have just finished the part of that. You will get the information, sir, from the other doctor.

In addition the Board proposed serious reductions in standards relating to examinations of pilots which we, as doctors, felt would increase the hazard to the flying public and persons on the ground also would be endangered. Upon careful investigation we found that the proposed standards had been drafted by what we believe were unqualified personnel who are employees of the Board and who conducted what they called medical surveys. We made our views known to the Board, yet they continued to propose their enactment of this proposal.

That will be settled when the doctor gets here.

It should be emphasized there is no research and no study to determine what we believe will be shown by any impartial study that standards for pilots must be increased.

In this connection it should be noted that the witness from the CAB told this committee yesterday, so I have been informed, of a study of United States air carrier accidents that proved there is no significant basis to the claim that physically unfit airmen have been piloting aircraft. It is incomprehensible to us that anyone could investigate such accidents without having the benefit of a full clinical assessment of the physical fitness of the pilot prior to the accident to say nothing of a full autopsy report and findings after the accident. Certainly such findings are not available since we do not have full clinical assessment of pilots—that is in advance—and we do not have full autopsy reports. Even assuming we had such findings and reports they would have to be evaluated by specialists in relating medical data to the conditions of the accident.

Since the CAB does not have and never has had any medical staff or persons qualified to make such investigations, we feel that the CAB study is obviously misleading.

What I have just said relative to the air carrier accident study of the CAB is even more true for the other classes of pilots—that it, the other two classes of commercial and private, where the accident rates are higher and where supervision is less controlled.

Here again we should mention the exacting physical and mental requirements that the jet age will inflict upon us. Jet age, of course, is maybe a year and a half to 2 years away—the beginning of it. We believe S. 1045 will assist us materially in making aviation safer by eliminating the present two-headed monster, one head being the CAB promulgating the regulations and the other being the CAA attempting to interpret and enforce these regulations. We have seen in practice that this system does not always work; confusion and uncertainty are present. It appears necessary that the Congress should make its will known that it desires a full and comprehensive civil aviation medical program be undertaken in one agency and we agree that that agency should be the CAA which already has the nucleus of staff and experience to perform the needed functions.

There is important precedent in the food and drug laws and in the armed services of one agency to promulgate the standards and enforce them. We believe the bill S. 1045 provides for sufficient safeguards to protect any pilot from abuse of discretion in connection with removal or suspension of his medical certificate.

I want to say that it has been a great pleasure for me to be invited here and we feel the deep interest which your committee has in this problem of civil aviation. We believe it is all presented and would be corrected by enactment of S. 1045.

We feel that if the bill could be enacted at an earlier date it would give us the framework for continuous development in civil aviation medicine and be in a much better status to accept the jet age.

Senator MONRONEY. Do you know, Doctor, whether there have been any revised examinations for physical fitness as a result of the entrance into the jet age for civilian pilots?

Dr. FENWICK. None for civilian pilots yet, sir.

Senator MONRONEY. Have they made more rigid and more strenuous the examinations for military?

Dr. FENWICK. Yes, sir.

Senator MONRONEY. Tell the committee something about that.

What are the requirements that differ from the qualifications that a pilot had to go through for a prop-driven job?

Dr. FENWICK. Well, as far as the jet, let us say the straight physical examination requirement, the visual acuity, those essentially remain the same. He should have 20/20 vision and his physical and mental examination be normal.

Now, the other thing——

Mr. BAYNTON. Doctor, you mentioned he should have 20/20 vision and that sort of thing. Does not this new standard propose to relax that requirement a little bit?

Dr. FENWICK. Some of the proposed standards would; yes, sir.

Mr. BAYNTON. Are you somewhat familiar with them? In other words, as I understand they propose to reduce 20/20 to 20/30.

Dr. FENWICK. That is right; 20/20 was to be reduced to 20/30. I believe the eye muscle balance tests were to be taken out; were they not?

Mr. FISHER. That is right.

Dr. FENWICK. I believe in that proposal; I believe the eye muscle standards were to be taken out.

Now, I do not have that in front of me, sir.

Mr. BAYNTON. As I understand it the proposal would lower the uncorrected vision requirements from 20/50 to 20/60 for the first class and 20/50 down to 20/100 for the second class.

Dr. FENWICK. I believe that is right, sir.

Mr. BAYNTON. Do you know whether the military is maintaining its 20/20 requirements in this field?

Dr. FENWICK. No, sir; I am a member of the Air Force Reserve and so far they have not relaxed any of the physical or mental standards for pilots.

Now, the chairman asked me what they did in addition. Here is what they do in addition.

Practically every pilot that is going to do—the new boys go through the chamber to find out what his altitude tolerance is, that is one of the things. They put him in a suit, in a pressure suit, and find out how much pressure he can take when the suit is pressurized, how high he can go. In other words, they are preparing him for the so-called jet age, in which the altitude at which we are going to be flying is much greater.

That is one of the things that the civil aviation has not done at all because they do not have the facilities.

Senator MONRONEY. Any other tests that you know of? What I am asking you about is whether there are finer tolerances, in other words, for the speed, the altitude, the fast takeoff and landings that will be required with a true jet over the prop-driven aircraft and in the aviation medicine, civil or military, if they have put that into the medical examination or whether it is a part of the check ride and the reflex action and things like that that is observed in the performance of the pilot?

Dr. FENWICK. It is a part of everything, sir, is what it is. But putting the pilot through the chamber is one of the very important things to find out his tolerance and he also—of course, they have not relaxed their physical standards. Their physical standards for a young pilot that is going to fly jet aircraft is 20/20, period. He cannot wear glasses, he cannot be 20/50, or 20/30, or anything else. At a later time in his life he can get a waiver and his vision uncorrected can drop, but even then he must be corrected to 20/20. We believe, for instance, that the correction to 20/20 is very important. Twenty/twenty is simply the normal vision and we believe that all the vision of all pilots should be corrected to 20/20, not 20/30, and he should not be allowed to fly at 20/30 and as this jet age does approach us he definitely is going to be approaching not only other airplanes but the ground and everything else at a much greater rate of speed. He needs a sharper vision.

Senator MONRONEY. Does that have anything to do with the depth perception, 20/20 and 20/30?

Dr. FENWICK. The depth perception, of course, is more—actually a man with visual acuity at 20/20 will do a better depth perception. That is a sort of binocular test. There have been arguments as to what the value of it is. Personally I think most of the flight surgeons, especially we oldtimers who have given a whole lot of examinations, still feel it is very valuable. It not only shows his sharpness in differentiating the distance that little road is from him which, without a doubt does help to show what his judgment of distance is, but, of

course, while he is doing that we study his nervous reactions and everything else. So, we get a lot more out of that test than just straight, let us say, eye results on eye findings. But I believe, and we have found—I ran an experiment at one time on a series of National Guard pilots and we found—this is many years ago—that those men who did poorly on their depth perception, we will say a man who had an average of 25 to 30, right at the borderline, 30 being the disqualifying requirement, did not make as sure and as accurate and as smooth landings as the man who had—we will say their average depth perception was down, not above 15. This was done and these pilots ranked, I think the oldest man at that time was 35, in our squadron and I tested about 36 pilots and that was just a little thing I carried on myself. But it really worked and it was an actual fact because I rode with every one of those men. I had to give them their psychological ride and I was also on full pilot status at that time myself.

Senator MONRONEY. Is it not given any more on your regular examination?

Dr. FENWICK. Yes, sir; we give the depth perception on the first and second class, not on the third class, and it is still used in the Air Force, too.

Senator MONRONEY. You may proceed.

Dr. FENWICK. I am through, sir. Thank you, sir.

Mr. BAYNTON. Doctor, as a designated examiner, what happens when a doctor is selected, what is the first thing that happens? Is he given literature from the CAB or CAA that tells him about it or somebody talks to him about this new field he may be going into, or what happens?

Dr. FENWICK. Well, sir, the usual routine would be a doctor, possibly out in a community where there is no examiner, and several pilots come around and ask him, tell him they would like to have a medical examiner in the community, and we will assume that he is not a graduate flight surgeon of the military—let us assume that. Many of our men are graduate flight surgeons, you see, who come back into civilian life and are now CAA medical examiners.

Mr. BAYNTON. Let us take a topnotch medical man who is not a flight surgeon.

Dr. FENWICK. In other words, a graduate of a medical school. He writes in to the head of the Medical Department, the Medical Division. In other words, he would write to the Chief of the Medical Division of the Civil Aeronautics Administration and tell them he wants to be appointed an examiner. He would, of course, be addressing Dr. Stovall, who is the head of the division. Dr. Stovall will immediately send him an application blank; it asks him what school he graduated from, all of his experience, is he a pilot, they always like to know if he is a pilot to find out whether he is airminded, his medical school, internship. In other words, the whole biography of his medical experience.

Then the doctor would send this in. Then, as I understand, they attempt to try to find out if there are too many examiners in that particular area right at that time, try to get it on so each examiner will have enough physical examinations to keep him interested because you can understand if a man does two a year he is not very much interested in any form of aviation medicine. So, then if there are enough pilots there and there is no other doctor within a radius, I

do not know if they use a mileage radius, whatever the determination is, why, he gets the appointment.

Now, he would be sent, then, a medical handbook. That is what we call it, medical handbook prepared by the Medical Division and in there it tells all the procedures. First it describes some of the technical things like the classes of pilots so he will know what he is dealing with. Also in his appointment he is told who he can examine. Some examiners can only examine third class which is student and private and second class which is commercial. They are not qualified to examine first class or airline transport pilots.

Most of the examiners in the airline transport pilots are in the larger cities, airline bases.

Then he has his book of airline information which is quite good and it tells him most of the things that he needs to know about both the technical and medical. Then it gives him all the medical requirements, even goes into detail to tell him how to do his eye examination. Also explains the type of equipment he needs which some doctors who have never done much eye work do not know. That is where we feel, instead of sending him a pamphlet that he can read, if we had a doctor who could go out there and show him, take some equipment with him, if necessary, in a little grip and show him how to use it, maybe these men—the eye examination is quite complicated and any eye specialist or opthalmologist knows how to get it. He does not know what a phorometer is, which is a machine for estimating the muscle balance of the eye.

Mr. BAYNTON. You are saying that this new medical examiner probably will not be contacted by a medical man who is an air surgeon or expert?

Dr. FENWICK. No, sir; as a rule he would not because there is nobody available to contact.

Mr. BAYNTON. Is that medical handbook current? Is it loose leaf, is it something—we heard some testimony yesterday that these standards were set up in the twenties.

Dr. FENWICK. No, sir; I have forgotten the date of our newest book, but it is about 1954, I believe. It is loose leaf and we get new sheets all the time to be inserted, sir.

Mr. FISHER. This might clarify the standards for the manual that were promulgated in 1926.

Mr. BAYNTON. I was wondering if the book had been put out at the same time.

Senator MONRONEY. Will you clarify that? The difference between the standards and the methods of examination to determine whether the candidate meets those standards or not adds to the different detailed work that the examining doctor has to go through?

Dr. FENWICK. Yes, sir; he must either memorize those standards or he must look at his book on every pilot that he has, or else he is going to make mistakes.

Senator MONRONEY. But his basic standards were the same since about 1929?

Dr. FENWICK. That is right, the basic standards. They were set up good right at the start and they have remained very well ever since. However, as I say, that man out there does not know, he does not get the training.

Mr. FISHER. Mr. Chairman, I do not know whether you received for the record or not but I have here a copy of a letter from the Airline Pilots Association dated June 5, 1956, to the Board where they announced that they were opposed to longer periods between examinations in the revised schedule of physical examinations.

I also have our comments. We would be very glad to introduce them for the record.

Senator MONRONEY. Could you summarize your comments? We would like to have the comments from the Airline Pilots Association but they are going to testify tomorrow. Mr. Sayen has been detained on the west coast, but briefly if you could sketch your objections.

Mr. FISHER. Our comments were that we objected very strongly, extension of time, and also we objected to the lowering of the standards that our eye people—our ophthalmologists feel that there was insufficient research that had been done. They feel that the Board had moved ahead on the basis of, well, I do not care to characterize it, they felt that there was no basis in medical research that would support these lower standards.

Senator MONRONEY. What was the date of those comments?

Mr. FISHER. 1956. It was published, sir, February 29, 1956.

Senator MONRONEY. They have never been put into effect?

Mr. FISHER. No, sir; and through the grapevine we understood that they had circulated another proposed regulation on this which even further lowered the eye tests so that muscle balance tests of the eyes would not be eliminated as well.

We in our comment pointed out that we felt that at this time increasing into the jet age when everybody should be very careful to make sure we had proper standards and proper exams, it seems quite ridiculous and absurd to us that thhe Board should now be trying to loosen and make this thing more flexible and looser, as we say. That is pretty much it, sir.

Mr. BAYNTON. There is a Board statement on that point that I might read into the record. This is contained in the letter from the Civil Aeronautics Board.

Senator MONRONEY. Read that.

(The above-referred to letter is as follows:)

CIVIL AERONAUTICS BOARD,
Washington, December 18, 1956.

Hon. A. S. MIKE MONRONEY,
United States Senate, Washington, D. C.

DEAR SENATOR MONRONEY: This is in further reply to your letter of October 12, 1956, concerning a letter received from Dr. Hedwig S. Kuhn, of Hammond, Ind.

Although it is not clear from Dr. Kuhn's letter, her complaints are apparently directed to a proposed revision of part 29, Physical Standards for Airmen, which was circulated in the form of draft release No. 56-6 for comment on February 29, 1956. This draft release was a proposal prepared by our Bureau of Safety Regulation and does not constitute a revision of the present standards, which can only be accomplished by Board action. In keeping with the Administrative Procedure Act, a proposal to amend or revise the Civil Air Regulations is made known to the public by publication in the Federal Register and by distributing copies directly to thousands of known interested persons. The chief purpose in this is to give opportunity to the public to participate in rulemaking. The comment of all interested persons is weighed carefully before a decision on final amendments or revisions is made. While the Bureau of Safety Regulation has been delegate by the Board to initiate proposed changes to the Civil Air Regulations in some cases and to obtain comment by interested per-

sons, it is emphasized that before any proposed amendment can be made effective the Board must consider and act on the proposal.

Over 300 persons and organizations representing every branch of the aviation industry and the medical profession responded to draft release No. 56–6. The comment was generally in the order of 3 to 1 in favor of each proposed change in the physical standards but the response to a proposal to lengthen the period between physical examinations was about equally divided.

Although this latter proposal generated strong objections from the Civil Aviation Medical Association, nonetheless we are pleased to receive their comment on our proposal. At the same time, however, we are aware of the economic interest possessed by the association inasmuch as thousands of airmen who are required to undergo periodic physical examinations provide a significant source of income to the members. Most of these objections to the proposal stress the advantages to the general public welfare of frequent physical examinations for the detection of diseases in the early stages of development, while they are still amenable to treatment. The Board has an interest in the effect of frequency of physical examinations on air safety, and in giving this aspect of the matter its most serious consideration.

In order that you may see the extent to which the draft release proposed to change the present physical standards, I am enclosing a copy of the present part 29, Physical Standards for Airmen, and draft release No. 56–6, Physical Standards for Airmen (Medical Certificates). The principal changes consisted of modifying the standards in order to decrease the large number of individual waivers which are now being issued by CAA. It was considered that those minor deficiencies which are now waived almost automatically could be handled more efficiently by direct certification. In other words, no one would be certificated under the new proposed standard who is not authorized to fly at the present time, either by certification or waiver.

As Dr. Kuhn referred specifically to the proposed new visual standards, it might be of interest to examine this part of the proposal more closely. The draft release proposed to reduce the visual acuity for first- and second-class certificates from 20/20 to 20/30 in view of the fact that in most instances a person with 20/30 vision can operate more effectively without glasses than he can with them due to restrictions to the field of vision and dirt and condensation on the lenses. Moreover, the medical standards developed at a recent meeting of the International Civil Aviation Organization in which the United States participated and concurred provide the same visual acuity requirement as that contained in draft release No. 56–6. The draft release further proposed to lower the uncorrected vision requirements from 20/50 to 20/60 for the first-class and 20/50 to 20/100 for the second-class certificates. This lower minimum appeared reasonable so long as the individual must wear glasses to correct the deficiency to 20/20. It was also proposed to delete the depth perception and phoria tests inasmuch as there is no evidence that they measure a pilot's flight ability.

Dr. Kuhn discussed this draft release before a meeting of the Civil Aviation Medical Association in Chicago on April 16, 1956. Referring to the depth perception test, page 54 of the transcript of Procedures of CAMA, Dr. Kuhn had this to say: "I agree that all the evidence indicates that now depth perception is not essential * * * " Regarding the phoria test, the transcript reports Dr. Kuhn said: "I will even agree on probable insignificance of distance phorias although this has not yet been proved conclusively." She did object to any lowering of the visual acuity requirements and recommended that every airman over 45 should have a full ophthalmological examination at least once a year.

Several hundred pilots are currently flying aircraft while having had the visual acuity standards waived. A study by the Analysis Division of the Bureau of Safety Investigation of the safety records of these pilots has indicated that safety has not been jeopardized. This suggested, therefore, that the physical standards of part 29 of the Civil Air Regulations are excessive and require revision. Furthermore, medical experts from some 20 ICAO member States, meeting in Paris in the spring of 1955, adopted visual acuity standards which are the same, with one minor exception, as those contained in our draft release.

The proposals in the draft release were circulated for the purpose of securing comment and additional professional advice from experts in the aviation and medical profession. The Board's staff is nearing completion of its study of the information contained in the many responses received and hopes to have a firm recommendation for consideration by the members of the Board at an early date.

The medical study to evaluate the physical standards for airmen, being conducted by the Flight Safety Foundation for the CAA, is being followed closely by the Board, and a member of our staff has been delegated to work with the committee conducting this program. However, we believe it would be difficult to justify delaying consideration of the large volume of technical information we received in response to our draft release and modification of our present physical standards in those areas in which a change in the standards is indicated. If at the time the report of the Flight Safety Foundation is published, further modification of the physical standards appears to be required, we can then proceed with proposals to amend the standards on the basis of the new facts which the study has revealed.

The Board is well aware of its responsibility for establishing reasonable standards so that the greatest number of persons can exercise their right to use the navigable airspace, and at the same time provide the necessary degree of safety. You may rest assured that when the Board comes to a final decision in the matter of amendments to its present medical standards, this reasonable balance will be achieved.

Sincerely yours,

JAMES R. DURFEE, *Chairman.*

Dr. FENWICK. Do you want some comment on that?

Senator MONRONEY. Yes, certainly.

Dr. FENWICK. Sir, just to tell you in a very few words what it would mean, it would mean that a cross-eyed man could fly. The test for phoria.

Mr. BAYNTON. Can a cross-eyed man fly? I do not know.

Dr. FENWICK. He might be able to, but certainly not in, I would say, airline transport flying. In the first place, most cross-eyed men see double under certain conditions, they definitely see double.

Senator MONRONEY. He will try to go between those two planes. [Laughter.]

Dr. FENWICK. He might do that, but I mean that is what throwing out the phoria test would mean; that is how you find out whether he has a tendency to cross eyes. Of course, if he is so cross eyed he looks like Ben Turpin, we pick up a latent, external and internal, meaning the type of man whose eyes divert and the type that convert is too much. Why is that important? Any over convert or divertness will develop fatigue at a much greater rate and that is why at the end of a long flight he might be unfit to land his airplane.

Senator MONRONEY. Well, it would seem to me that there is going to be a vast amount of eye strain at 30,000 or 50,000 feet and at 500, 700 miles an hour and particularly on a closure that could run as high as 1,200 or 1,500 miles an hour. That a pilot is bound to be straining all the time and, therefore, the conditions of his eye muscle, as an amateur doctor, I would think would have to be in pretty good shape.

Dr. FENWICK. Sir, that is a wonderful deduction. That is correct.

Senator MONRONEY. Apparently instead of tightening up or at least looking more carefully to the muscular condition of the eyes this would tend to reduce them. Is that correct?

Dr. FENWICK. Yes, sir; this proposal.

Senator MONRONEY. Let me ask you one question and you tell us if you want to, you do not have to tell us if you do not want to.

Dr. Fenwick, you have been very much interested in this bill and I think you had something to do with suggesting many of the things that you felt should be in a program for the development of the civil aviation medical division. Was this stimulated somewhat by the CAB's efforts to change these rules of medicine and to weaken and water down the requirements?

Dr. FENWICK. Yes, sir; it was.

Senator MONRONEY. It was?

Dr. FENWICK. Yes, sir; that definitely helped to culminate the thinking, to realize that something like that could be put into effect which would greatly endanger our whole program of flying safety and we could not even get in there to fight for it in a medical way.

Senator MONRONEY. And your examining doctors get paid just as much if they turn a man down as if they pass him?

Dr. FENWICK. That is right.

Senator MONRONEY. They could not be possibly charged with anything other than wanting to get the very best possible examinations to qualify men for flying?

Dr. FENWICK. In general our doctors are very conscientious I am sure.

Senator MONRONEY. And most of them have been in the examining business a long period of time; am I not right?

Dr. FENWICK. Most of the key men have; that is right.

Senator MONRONEY. They do not change very often, once a man is certified or given a job as medical examiner he usually stays on there as long as he is active in practice?

Dr. FENWICK. That is right.

Senator MONRONEY. He is not appointed—what I am trying to get at is he is not appointed for 1 year, 2 years, 3 years, and reappointed every time the administration changes?

Dr. FENWICK. The real fact is he is appointed every year.

Senator MONRONEY. He is appointed every year?

Dr. FENWICK. That some men object to, but that is the policy of the Medical Department. Now, the medical division, I should say, at the end of each year you are reappointed. Now, of course, if a man has been doing good work, it seems like more or less he is just automatically reappointed, and I believe that was put in. I have heard that discussed in the Aero-Medical Council mainly so men who were inefficient could be dropped easily, without too much ado.

Mr. BAYNTON. Only one further thing.

You indicated, I believe, in your testimony, Doctor, that some of the reports, the turndowns did not reach headquarters and someone yesterday testified that it was possible in the private pilot field to shop around a little bit to find a doctor that would pass him. Is there any pressure or attempt by the CAA to police that field, to get their reports in so that when a man is turned down by an examination there will be some record of it?

Dr. FENWICK. Yes, sir. In the handbook of instructions to all doctors, regardless of whether a man is qualified or disqualified, we are advised to send a report in to Washington, and so they will have it, even if only a partial examination is done. But here is what happens. Here is a doctor out in the field, most of this is in private pilot class, and a kid from the neighborhood comes in, maybe it is a boy he delivered 16 years ago or something, you see. A boy comes in and wants a medical certificate for flying. He sits down and the doctor starts examining him—28/100 vision, see, 28/100, maybe worse, maybe cross eyed, or something to that effect. That is definitely disqualifying. So, usually the doctor says, "Oh, you shouldn't fly. Go on home, Bud, don't come back and bother me any more; you shouldn't

fly." Why does he do that? Why does he not send a report in? He does not want to waste a lot of time with the kid, he hates to charge that boy when like in medicine they like to get something from a doctor the same as they do when they buy an automobile. So, actually it is not correct administratively. We wish all doctors sent those in, we know a lot of them do not. That is the main reason. I have questioned a——

Mr. BAYNTON (interposing). So if that lad wants to fly a little bit he might try a few more doctors?

Dr. FENWICK. That is right. There is no official record and we, in our association, are trying to get that to every doctor, send in a report. We are working on that.

Mr. BAYNTON. That is all I have.

Senator MONRONEY. Doctor, you have been very helpful to the committee and we appreciate you and your general counsel being here.

Dr. FENWICK. Thank you, Mr. Chairman.

Senator MONRONEY. I would like to call our next witness, Mr. Leo Seybold, vice president of the Air Transport Association of America. Mr. Seybold.

Senator MONRONEY. You may proceed, Mr. Seybold. Would you like to introduce the men who are with you for the record?

Mr. SEYBOLD. Yes.

STATEMENT OF LEO SEYBOLD, VICE PRESIDENT, AIR TRANSPORT ASSOCIATION OF AMERICA, ACCOMPANIED BY DR. LUDWIG G. LEDERER, CHAIRMAN, ATA MEDICAL COMMITTEE; AND WILLIAM B. BECKER, ASSISTANT VICE PRESIDENT OF OPERATIONS, ATA

Mr. SEYBOLD. Mr. Chairman and members of the committee, my name is Leo Seybold and I am vice president of the Air Transport Association. I have with me Dr. L. G. Lederer, chairman of the Airline Medical Directors Committee, and Mr. William Becker, assistant vice president of operations of our association.

The membership of the association includes the 49 scheduled air carriers of the United States. We appreciate the opportunity to express our views on S. 1045, because it deals with a subject which is of great interest to our industry, and one to which we have given a great deal of attention. The improvement of safety in air commerce through the development of sound aviation medical standards and practices is a field with which we are always concerned. While we support some of the general objectives of this legislation, we have many reservations on certain of the provisions of S. 1045, and consequently do not, at this time, support the bill itself.

One of the major objectives of Congress in enacting the Civil Aeronautics Act of 1938 was the achievement of safety in air commerce. These objectives were stated in broad terms and the responsibility for attaining them was placed upon the Civil Aeronautics Board and the Civil Aeronautics Administration. In assigning that responsibility, Congress did not attempt to specify the detailed organization or specific regulations which those officials should establish to carry out the safety responsibilities which had been placed upon them. Rather, the type of organization was left to the judgment and discretion of the officials who had the responsibility. Congress

also gave the full power and authority to the Board to establish rules and regulations, including the delegation of rulemaking authority to the Administrator.

Congress did indicate areas of aviation with which it wished the Board and the Administrator to concern themselves with respect to air safety. In particular, the Board and the Administrator were empowered and given the duty to promote adequate minimum standards and reasonable rules and regulations in a number of areas including the following: (*a*) The design, construction and performance of aircraft, engines, propellers and appliances; (*b*) the inspection, servicing, maintenance and overhaul of such aircraft and component parts, as well as supervision of the facilities, and personnel involved in such work; (*c*) facilities and procedure for the safe operation of aircraft; (*d*) the qualifications of persons who should operate and maintain aircraft and facilities for their navigation, as well as the training of such persons.

In none of these areas did Congress specify either the organization, the standards or the regulations for achieving those standards which the Board and the Administrator must follow to attain the broad objectives of safety in the air.

The airlines feel that the rather broad manner in which the Civil Aeronautics Act treats these matters related to aviation safety are an advantage rather than a disadvantage and experience has proved this to be the case over the years. The aviation industry is too dynamic to be enmeshed in detailed legislative provisions, the amendment of which would need to be continuous and rapid because of the growth of the industry and its ever-changing complexities.

The qualifications for airmen as well as the determination of persons who meet these qualifications, is left in the hands of the officials upon whom responsibility for achieving air safety was placed. Congress did not attempt to specify the machinery for establishing airmen's qualifications any more than it attempted to establish the specific standards for aircraft, engines, or their component parts which meet those standards. In other words, the physical qualification of airmen is one of a number of important factors involved in the achievement of air safety, just as are the design of the aircraft and its parts, and its maintenance and operation.

It appears to our industry, and we believe the record will support it, that the Board and the Administrator have been doing a good job in establishing minimum airmen's physical standards and regulations. In this field of aviation safety, the Civil Aeronautics Act has worked well without the detailed organizational structure and regulations which are proposed in this legislation. Over the years, aviation safety has had a remarkably clean record insofar as the effect of medical requirements and physical capabilities of airmen is concerned.

It should not be overlooked that many of the major airlines themselves maintain continual surveillance over the physical standards of their own pilot personnel. Not only do pilots and other airmen have to meet the professional as well as physical standards established by the Civil Aeronautics Board and the Civil Aeronautics Administration, but they also must meet the requirements of the individual airlines which, in many cases, are more strict than the Government standards. A number of airlines either have their own medical directors,

frequently plus a staff, or retain a medical adviser to assure that the physical capabilities of pilots and others are proper for their particular jobs in the company. Here again, as far as the scheduled airlines are concerned, the record has been remarkably clean as it relates to the physical deficiencies or proficiencies of airline personnel.

In urging that Congress adhere to its policy of broadly stated objectives with responsibility and authority delegated to the officials who are to carry out its objectives, we do not mean to imply that nothing can be done by way of improvement in the aviation medical field. We feel that there are a number of steps which can and should be taken, and several of them revolve around ideas contained in this bill. We also feel that the answer to further improvement does not lie in the grant of unusual power to a civil air surgeon.

We have three specific suggestions to make: First, there should be a strengthening of the Civil Aeronautics Administration medical examination program. Second, there should be some formalized provision for getting medical advice into the hands of the Civil Aeronautics Board. And third, there should be more adequate provision for the pooling of aviation medicine research information.

We believe that adequate authority already exists in the Civil Aeronautics Act to carry out each of these recommendations. We will comment briefly on each of them.

At the present time, airline captains are required to take two Civil Aeronautics Administration physical examinations per year, and these are performed by a CAA-designated medical examiner. Of the approximately 1,800 designated examiners, both domestic and overseas, approximately 400 have been designated to conduct an airline transport rating physical examination. They are independent doctors who have been designated by the Civil Aeronautics Administrator to conduct these examinations. The medical examination program could be strengthened if the Administrator were to appoint a panel of independent medical consultants to advise him in the administration of medical matters. Such a panel, working with the Chief of the Medical Division, could, from time to time: (*a*) Review the qualifications, equipment, and facilities of the CAA medical examiners; (*b*) make recommendations to the Administrator on the supervision and administration of the medical examination program; and (*c*) advise the Administrator on matters of research in the aviation medicine field. Such a panel would have the advantage of bringing to the Administrator and the Medical Division the advice and counsel of a group of iindependent aviation medical experts, with a wide range of experience.

At the present time, to the best of our knowledge, the Civil Aeronautics Board itself has no medical organization nor has it set up any formal procedure for receiving the benefit of medical advice. However, the Board has certain responsibilities with respect to the promulgation of physical standdards of airmen which it cannot delegate to the Administrator. Such a panel could assist the Board in promulgating regulations involving aviation matters. The Board also has the function of resolving controversial cases involving medical matters. For example, if an applicant for an airman's license is denied his application by the Administrator, or if an applicant is denied the renewal of his license by the Administrator, under the

statute, he has the right of appeal to the Civil Aeronautics Board for review of his application and qualifications for the license. If the application has been denied by the Administrator on medical grounds, this is a princpal issue before the Board in determining his capability to hold a certificate. In such cases it would be advisable for the Board to have the advantage of a medical panel to which it could turn for advice. The final responsibility should always rest with the Board.

As to research, we know that a substantial amount of work is being done in the aviation medicine field by well-qualified individuals and organizations throughout the country. There would appear to be some advantage, however, in establishing a procedure for pooling, within Medical Division of CAA, existing knowledge and research in the aviation medicine field. This could be done without establishing an expensive Civil Aeronautics medical research laboratory.

The Federal Government at present is conducting extensive research in the field of aviation medicine, primarily through the work done by the Air Force and Navy Departments, either within the Departments themselves or by contract with outside qualified institutions. No doubt there are fields of medicine which are peculiar to civil aviation and in which research would be beneficial. This could easily be accomplished under existing statutes, by the provision of funds to the Civil Aeronautics Administration, upon a convincing showing of need, and by farming out the research through Government contracts to the many schools, universities, and other institutions which already have the qualified personnel and facilities to conduct aviation medical research. In addition, the result of such research by contract would be far more productive, because of the ability of the CAA to contract with institutions having the best specialists in particular fields of aviation medicine.

We believe the three recommendations we have made here can be effectively accomplished under existing statutory authority.

We sincerely appreciate, Mr. Chairman, the opportunity to furnish the views of the airlines on this very important aspect of aviation safety. We want to assure you that the airlines will cooperate with the Civil Aeronautics Administration and Civil Aeronautics Board, as well as with the Congress, in any way be can to advance a sound aviation medical program.

Senator MONRONEY. Thank you, Mr. Seybold. You mentioned, I believe, Dr. Lederer was head of one of the——

Mr. SEYBOLD. He is chairman of the Airline Medical Directors Committee as well as—I will let him state his own qualifications if you care to ask him.

Senator MONRONEY. The main thing we are trying to have identified is some of the extra work that is being done by the airlines. In other words, we gather a good deal of information on the medical program and we have heard from the examiners for the CAA but we have not identified much the fine work that is being done by the airlines.

Mr. SEYBOLD. I think if you would like, Dr. Lederer would be glad to coment on the research that is going forward that he knows about.

Senator MONRONEY. All right, and what functions you perform and the duties that you have outlined with the airline medical departments to keep a continuing running check on the disqualifications of the airline in these lines.

Mr. SEYBOLD. I may say at this point that the Air Transport Association opposed the proposed relaxation of the standards and of the period of examination that was proposed by the CAB.

Senator MONRONEY. You also were against it?

Mr. SEYBOLD. Yes, sir.

Senator MONRONEY. Dr. Lederer?

Dr. LEDERER. Mr. Chairman, all of the major airlines maintain some sort of medical facility. It varies in size, personnel, just like the airlines do. Our main function as far as the pilots are concerned is twofold: selection and maintenance.

Now, I heard this morning rejection rates and it interested me very much because our rejection rate on initial copilots—now, these are men who have already established their flying ability and have been certificated by the Government—runs about 9 percent within the airline. Our initial standards are very high and for a specific purpose because aging is incessant and when we take a pilot we beam him for about 30 years of service with an airline.

Now, I don't want to be quoted on that figure. It may be more or less——

Mr. BAYNTON. Doctor, you are quoted. [Laughter.]

Dr. LEDERER. The reason I say that is because I got in trouble. I said "25 years" once before, and I got in trouble.

Senator MONRONEY. That 9 percent rejections.

Dr. LEDERER. Yes, sir.

Senator MONRONEY. Would you say—excuse me for interrupting, you go ahead and finish, then I will question you.

Dr. LEDERER. Go ahead, sir.

Senator MONRONEY. I just want to amplify the record. Would you say that 9 percent is strictly medical or is it partly on other bases of general adaptability, suitability, personality, various other things, or is it all related to either medical or mental?

Dr. LEDERER. The Chair makes a good point. There are a number of facets that we use in assessing an initial copilot. We give him a battery of mental tests, usually a personality test, a mechanical-aptitude test, and an intelligence test. Recently we have been utilizing the Stanine testing which was developed by the Air Force during the war, a mental-aptitude test for flying which has been validated. That is Dr. Flannagan's test. Then, for example, through a comprehensive physical examination and then he is usually talked about with the chief pilot and supervisory pilot personnel where they give comments on his general flying ability, his experience, so that the man is assessed as a whole, not just one facet.

However, if we find a medical disqualifying condition, one which was going to give this man trouble in the immediate future, that takes precedence over the comments of the other members of the pilot selection board.

Now, 9 percent—let me explain that. We do not mean that man is not able to fly an airplane. It means that he will give us medical trouble before time; that is, before he should. In assessing the man we want to keep passing this minimum CAA standard which we feel should be kept at a minimum for the 30 or 35 years that he is going to be with us.

I might say that the type of medical examination given by most airlines it would be quite an expensive one compared to a minimum CAA physical test.

Senator MONRONEY. In other words, do all airlines in addition to the CAA minimum test give their own tests to the pilots?

Dr. LEDERER. Not all airlines, Mr. Chairman; the major airlines.

Senator MONRONEY. The major airlines do, particularly before a pilot is employed. I mean it is almost a mandatory operation.

Dr. LEDERER. That is the main one, after that in many instances they come back for an annual physical examination. I might state also that we also require our copilots to pass not the commercial physical but the first-class physical of CAA.

Senator MONRONEY. In other words, they are forced to rate higher than the minimum required?

Dr. LEDERER. That is right, technically they can get by with a second-class physical.

Senator MONRONEY. Navigators can, too, can't they, engineers?

Dr. LEDERER. Oh, yes.

Now, there again it varies, Mr. Chairman, according to the structure within each airline. In my particular airline we hire all of our flight engineers as copilots.

Senator MONRONEY. What line is that you are with?

Dr. LEDERER. Capital Airlines.

Senator MONRONEY. In the other work do you have doctors on duty, I mean in the company, where they help to look after the health of the pilots or anything?

Dr. LEDERER. Well, every airline has a line consultant in every city in which they operate. Now, that man is retained on a per case basis, he is not a direct employee of the airline. In many instances we use CAA examiners that we know are proficient as our consultants in the various cities. Also, some airlines are large enough to maintain submedical divisions; for instance, United Airlines has five submedical divisions. That is maintained by their own company doctors and their own company personnel.

Senator MONRONEY. Are doctors of these airlines concerned over new standards that might be required as we move into the jet age?

Dr. LEDERER. Yes, we are always concerned whenever proposed standards come up because we look at them with a distant eye as to how they may affect our own personnel over a long period of time. If the standards are too strict we might object because we feel in many instances that skill, judgment, and experience should override some physical condition, and the airlines provide this skill, the pilot provides the judgment and the experience.

Mr. BAYNTON. Mr. Seybold, on page 6 of your statement it says as to research:

> We know that a substantial amount of work is being done in the aviation medicine field by well-qualified individuals and organizations throughout the country.

I gathered from testimony we have heard that there is considerable research being done for the military but it would appear that the amount of work being done for civilian aviation may be a bit overexaggerated to some extent. Can you answer that?

Mr. SEYBOLD. I believe the Administrator of the CAA testified yesterday that at the present time there are no less than 58 aeromedical research projects being conducted by military and civilian organizations throughout the country. In addition, we do know that the Civil Aeronautics Administrator has appointed recently a special committee to advise him on the need for possible revision or a reevaluation of his medical standards, and to advise him in other ways with respect to aviation medicine matters. We feel that if there were a pooling of the research and it were possible for the CAA to provide some means for collecting and properly analyzing and distributing the information that is being made available throughout the country, that it would mean a saving to the Government over the idea which is proposed in the bill of establishing this laboratory because we think much of the work that is being done by the military is perfectly applicable to the civilian medical field.

Mr. BAYNTON. But you can't break down those 58 projects or whatever it is as to the military and civil?

Mr. SEYBOLD. No, I can't right now, but if it were desirable to get that information I believe we could.

Senator MONRONEY. As I recall the testimony, it was that all but about 4 or 5 were military. They couldn't give us the dollar figure and it sounded to me like it was an extra large project for the military aviation while we were starving to death the civil aviation side of it.

I think the testimony was also that there were some other factors involved, 100,000-foot altitudes and friction of speeds in the air of perhaps twelve or fifteen hundred miles an hour, a lot of Buck Rogers type of things that we don't anticipate quite immediately in civil aviation, that they have to go way beyond the area that civil aviation is going to be interested in.

Mr. SEYBOLD. We indicated, I think, that we thought it would be desirable for the Administrator to have some funds, we aren't prepared to say how much, that he would have available to farm out research work to qualified organizations in specialized fields where a need for further research is indicated in the civil aviation medicine field.

Senator MONRONEY. Is ATA doing anything on that on their own? I mean, in concert with all the scheduled airlines?

Mr. SEYBOLD. The ATA is doing some work in the field of qualifications for jet flying, but at this time I would rather not indicate the nature of it.

Mr. BECKER. Mr. Chairman.

Senator MONRONEY. Would you state your name?

Mr. BECKER. William Becker, with the Air Transport Association.

We have had some symposiums, so-called jet age symposiums, offered us and given to us by the Air Force and one of them in the field of the medical side of aviation.

Now, Dr. Lederer was there at some of those, or at the one I had in mind on oxygen particularly, how we are concerned in oxygen in airplanes, pressurization, et cetera. His committee met with the Air Force's out at Wright Field.

Senator MONRONEY. What was it, just a symposium of a day or two?

Dr. LEDERER. Yes.

Senator MONRONEY. Is there anything related to the Air Force experiences in jet flying that will indicate adoption necessary of new rules and regulations in civilian——

Dr. LEDERER. Really not much, Mr. Chairman. We were highly impressed by the fact that our thinking of today is almost directly applicable to the jet age in the type or field of transport flying. Now, in combat flying it is a different matter. We were most pleasantly surprised by the fact that there are no new physical standards being contemplated by the Air Force for jet pilots. They are maintaining their same standards and as age creeps up they are even giving waivers.

The only new thing that they stress was the fact that if we are going to fly above 25,000 feet we are entering a new realm of existence and the pilots may have to be indoctrinated to certain conditions of low-oxygen pressure, sudden low-oxygen pressures, and they recommended oxygen indoctrination programs and possible sudden decompression experience.

I saw vision was discussed a lot today and they make one comment that perhaps in the jet age we are going beyond the realm of human ability, the closing rates will be so fast that it doesn't matter how good an eye you have got, in fact you won't be able to see anything.

Also, vision glare was discussed and they maintained that unless light reflects off an object you won't see the object at thirty-five or forty thousand feet. So, for that reason I think ATA wants to comment on another thing they are going into because in certain cases we have to realize that the human factor stops and machinery has to take over.

Mr. BECKER. Well, I think you have reference to—our effort has been for over a year or a year and a half to get an anticollision device that will work, and we haven't got it yet, but there is a lot of work being done on it by a lot of very competent people.

Senator MONRONEY. That may be a better safeguard than 20-20 vision.

Mr. BECKER. We hope it is.

Senator MONRONEY. Particularly at high altitudes.

Mr. BECKER. That is right.

Senator MONRONEY. Do you feel that the airlines should expand their medical services to where they, too, would have a part in this investigation or studies as to new techniques in the jet age?

Mr. SEYBOLD. I think that would be helpful.

Senator MONRONEY. Your feeling is that the Government could do most of it and could by contracting with colleges who are now engaged in aerial medicine bring about further advances and make them readily available to the entire aviation industry?

Mr. SEYBOLD. Right; that is what we feel.

Senator MONRONEY. And this bill, therefore, as to the research and all could be handled under prevailing law rather than the requirement for a new——

Mr. SEYBOLD (interposing). Yes; some possible minor language in authorizations, things of that sort.

Senator MONRONEY. I do not believe you commented on the sections found on page 5 of the bill where it provides that—

SEC. 1406. Civil Air Surgeon shall promulgate such regulations as he deems necessary—

(1) for the inspection of aircraft and aircraft components and appliances designed for use in air transportation in order to meet the human requirements in aircraft design and operation; and

(2) for the inspection and appraisal of medical examiner facilities and procedures to insure proper assessment of * * *

In other words, do you think the bill should require in any way the right of approval of air equipment?

Mr. SEYBOLD. We do not feel that a medical officer of the CAA should be the final authority in the approval of the design or construction of aircraft. We feel that the final authority should rest with the Civil Aeronautics Administrator, because there are many other factors involved in the final determination of what is a proper airplane and the human factor and provision for the human factor is one of many. We think it would be just as wrong to elevate the civil aviation medicine problem to a status that is above the professional qualifications of the airman or the design or operating characteristics of the aircraft.

Senator MONRONEY. In other words, most of the human requirements are taken care of just as a matter of course today unless there is some unusual feature, if you run into lack of oxygen or lack of ability to pressurize at a 50,000-foot altitude or something, you just stay out of that altitude until you find the means of getting up there safely?

Mr. SEYBOLD. That is correct.

Senator MONRONEY. So, by and large most of the design of aircraft is going to be pretty well what the engineers and the traveling public and the experienced people over the years have found it necessary to be, the same as it was in railroad cars or pullmans or automobiles or anything else?

Mr. SEYBOLD. That is exactly right.

Senator MONRONEY. And that while greater authority might be given to the Air Surgeon General or the new facility for aviation medicine, that they should not be given a veto power over the type of construction and equipment that goes into an airplane?

Mr. SEYBOLD. Right, nor elevated to a status that puts them on a plane above these other very important aspects of the safety problem.

Senator MONRONEY. We thank you very much for your statement, and are glad you came here to give us the benefit of it.

We have a statement from the American Medical Association. I will ask Mr. Baynton, our counsel, to read it into the record.

Mr. BAYNTON. Mr. Chairman, this is a letter signed by Thomas H. Alphin, M. D., director of the American Medical Association, addressed to the chairman of the committee.

We regret that we were unable to have a witness testify today on S. 1045, which would establish in the Civil Aeronautics Administration an Office of Civil Aviation Medicine and create a medical research institute thereunder.

In February of this year our association, at the request of the Under Secretary of the Department of Commerce, Louis Rothschild, appointed an ad hoc committee of physicians with outstanding records in the field of Aeronautical Medicine, to make a study and recommendations in the area needed to improve the organization and functions of civil aviation medicine.

This committee met with Deputy Civil Aeronautics Administrator William B. Davis and some of his technical people to define the problem more accurately. At present our association is reviewing material in this field and until its completion is not in a position to support, oppose, or recommend modifications in the bill being considered by your committee. For that reason it is hoped you will find it appropriate to defer action for the present so that we can be of service in advising your committee of the results of the study and the recommendations resulting therefrom.

Attached is a list of the special American Medical Association committee.

And there is attached a list of very distinguished medical men.

I might if I may, Mr. Chairman, comment that the letter points out that the Under Secretary of Commerce set up this committee in February of this year and S. 1045 was introduced on February 4.

Senator MONRONEY. We have another witness from the Aircraft Owners & Pilots Association, Mr. A. G. Armstrong, representing the Aircraft Owners & Pilots Association.

Mr. Armstrong, we are glad to have you here and we will be happy to hear your statement.

STATEMENT OF A. G. ARMSTRONG, ON BEHALF OF THE AIRCRAFT OWNERS & PILOTS ASSOCIATION

Mr. ARMSTRONG. Thank you, Mr. Chairman. AOPA considers it a real privilege to speak before this committee in connection with this matter.

If I may I would like to read a letter which the President of AOPA has directed to yourself, sir. This letter is addressed to Senator Monroney, and its tenor is as follows:

The Aircraft Owners & Pilots Association—AOPA—having studied S. 1045 with care, respectfully requests your committee to consider our serious and considered opposition to the objectives proposed.

AOPA considers that the delegation of rulemaking to, and the establishment of regulations by, technical persons rather than regularly constituted bodies having broad overall responsiiblities, is fundamentally wrong. With respect to the cost of establishing a third medical empire, duplicating the vast aviation medical establishments of the Navy and the Air Force, AOPA strongly believes the taxpayer should be spared such an unnecessary expenditure.

AOPA is a nonprofit association of over 65,000 pilots and owners of civil aircraft. We act only for and in the interest of our members. In this instance, our members overwhelmingly oppose both the objective and the wasteful and unnecessary expenditure of public funds which this legislation would authorize. The duplication of existing aviation medical facilities already available to the Government, would further increase the shortage of capable personnel necessary to our national scientific and medical efforts.

AOPA actively supports aviation safety by every means available. A majority of our members make voluntary contributions to the AOPA Safety Foundation, Inc., for safety and research. AOPA knows of no organization devoted to safety which supports the objectives of this bill.

A brief discussion of pertinent provisions of the proposed legislation follows. Should the committee wish for a more detailed discussion of S. 1045, members of our headquarters staff will be available

for a further presentation of the many aspects determining our position.

With respect to section 1405 which authorizes the Civil Air Surgeon to promulgate regulations. It cannot be questioned that a medically trained man is most familiar with the needs for medical and physical fitness for airmen. There is no question but that the medically trained man can assist the aircraft designing engineer in establishing an optimum cockpit designed to fit human limitation. In neither case, however, should such regulations be promulgated by either the medical man or by the aircraft engineer.

Section 1411 prohibits current administrative functions of the CAB and the CAA long estiblished by Congress. The making of rules and regulations by the CAB and the CAA for physical fitness of airmen, and the airworthiness of aircraft currently authorized, is considered fundamentally proper.

Section 1416 authorizes the establishment of a civil aeronautics medical research facility. It is well known that both the Navy and the Air Force have invested many millions of dollars in medical research facilities primarily concerned with the physical fitness of airmen. To duplicate such an expenditure is considered wasteful and unnecessary since the results of all the work done by the military is or can be made availble to the Medical Division of the CAA.

If the military are not now cooperating with the Medical Division, Office of Aviation Safety, of the CAA, the Congress could well ascertain why. On the other hand, if our understanding is correct that there is full cooperation and coordination between the military and the Medical Division of the CAA, then there is utterly no excuse for such an expenditure of public funds.

In brief summary, AOPA considers that increased "safety in air commerce through the development and application of sound medical knowledge in civil aviation" is most desirable. We believe these objectives can be achieved under existing laws and within the present organization of the Medical Division of the Office of Aviation Safety of the Civil Aeronautics Administration, and at a minute fraction of the cost to the American taxpayer of the foregoing proposed legislation."

This letter is signed by J. B. Hartranft, president of AOPA.

Senator MONRONEY. You mentioned that you might have some further comment to make or a more detailed discussion of this matter, particularly with reference to the cockpit designs.

Of course, on some transport planes they have been notoriously small for midgets and with tiny slots for visibility, but that would be more or less a matter of working it out rather than medically, would it not, with the engineers and with the pilots who must fly the planes?

Mr. ARMSTRONG. Mr. Chairman, with respect to cockpit visibility, AOPA has been carrying on quite an effort to get increased visibility. We have written to the manufacturers of aircraft and permit me, sir, we are concerned primarily with the smaller plane manufacturers, but by the same sign we recognize that many of the smaller aircraft have better visibility than some of the larger aircraft. We have concerned ourselves seriously with that problem.

Senator MONRONEY. Small planes have to have better visibility to get out of the way sometimes.

Mr. ARMSTRONG. If I may, Mr. Chairman, I do have a few remarks that I would like to make if the committee has a moment.

Senator MONRONEY. We would like to hear them.

Mr. ARMSTRONG. I would like to say specifically that AOPA recognizes the great contribution of the medical profession, medical science to aviation, we do not decry their importance in any aspect. We do feel, however, that they are only a part of the picture, that the aircraft is a compromise from start to finish. It has been and I would assume it always will be.

If you let the electronic engineer have his way you would not have room for the passengers, of course, and all of the other aspects. It is a compromise and the Congress has seen fit in its wisdom to set up certain administrative functions in the CAB and the CAA, AOPA does not necessarily agree with everything that they do, but we support them in their carrying out their duties established by law.

If I may make some additional observations, sir.

I would like to make sure that it is understood that even though I am a retired admiral in the United States Navy, after more than 30 years active duty of which the majority was as a naval aviator, I am not speaking for the military nor for the air transport people—they have their own problems—but these observations are from my general experience and general knowledge.

As I said, AOPA has a safety foundation, we have developed something which we feel is very important for aviation safety, that is 180° rating which AOPA has made available to State aviation officials to teach. That is just one of the many things.

We feel that the medical profession has a great contribution but not as an empire. And the reason I say that is we feel that doctors are human. I would like to give a couple of brief cases.

One of the most outstanding pilots who ever went through Pensacola, he went through with the shortest time and highest grades and with no difficulty. In other words, he was medically perfect in every way, crashed and killed himself within 3 months of the time he joined the fleet.

I know another young pilot that went through Pensacola and was given a very high rating. His skill and ability in the squadron were most outstanding. Yet, he found himself unable to live with certain requirements, rules, and regulations and he crashed and killed himself and four other people.

Now, no medical problem was there at all. Foolhearty.

Senator MONRONEY. Carelessness does not show up in a medical examination?

Mr. ARMSTRONG. No, sir.

Senator MONRONEY. Through nervousness or anything?

Mr. ARMSTRONG. I was just going to say, sir, that the biggest problem, the most important job of the flight surgeon in the Navy is not given to the annual physical examination which is given and which we think is important, but it is seeing those people at the hours they are going to fly, looking at them; and they stop them when they are not fit to fly.

Again, I am not speaking for the military; I am speaking from my own experience. This business of increased length of time between physical examinations, we are referring to the private pilot, we feel

that the private pilot and the automobile driver have a great deal in common. It was stated that the private pilot is the menace to aviation. We feel that it is not the physical sandards, it is the traffic control, it is that we must have human engineering in our control of traffic rather than in the engineering of the man. We cannot change the man, we have got to accept him. If it is going to be a general operation as the automobile, it must be accepted.

Finally, sir, I will only repeat that we feel that the CAB and the CAA can and must make their own recommendations with respect not only to medicine but with regard to the other aspects of safety involved in aviation.

Senator MONRONEY. What do you think about the stretchout on the examination time? You have heard that the ATA and various others oppose this rather vigorously and I am wondering if the Aircraft Owners and Pilots Association supported it since they were, I think, 5 years' time between examinations they were offering.

Mr. ARMSTRONG. I am not prepared, sir, to give you any great amount of data. I can say that we do not particularly oppose lengthening the period between physical examinations and I base that on something that the American Automobile Association puts out. They say that the individual's mental condition at a particular time is more important in whether he will have an accident going home from work after he has had a fuss with the boss or going to work in the morning after he has had a fuss with his wife or something like that, than his long-term physical condition. That is our viewpoint. We feel aviation is for all Americans within minor limits.

Senator MONRONEY. And do you think, though, if they had those examinations as often as they have today that that might cut down a few?

Mr. ARMSTRONG. AOPA——

Senator MONRONEY. You don't have to have them every 2 years, I don't think, in private flying and this change, as I understood the testimony, would lengthen it out to 5 years.

Mr. ARMSTRONG. We do not particularly support nor de we particularly object to it. We feel that the individual has got to keep himself in proper condition between the 2 year periods or he should stay out of the air and unless we are prepared to police him in his daily movements and living we cannot control him.

Senator MONRONEY. Do you have any questions?

Mr. BAYNTON. No questions.

Senator MONRONEY. Thank you very much, Mr. Armstrong, for your statement and that of the Aircraft Owners & Pilots Association.

(The following additional statement was submitted:)

AIRCRAFT OWNERS AND PILOTS ASSOCIATION,
Washington, D. C., April 5, 1957

Senator A. S. MIKE MONRONEY,
Chairman, Aviation Subcommittee,
Senate Interstate and Foreign Commerce Committee,
United States Senate, Washington, D. C.

MY DEAR SENATOR MONRONEY: AOPA appreciates very much the opportunity given us on April 2 to present our views on S. 1045. We request that your subcommittee consider further comments with respect to testimony of medical officers on standards of physical fitness of pilots.

AOPA specifically questions testimony by medical witnesses that safety in air commerce is hazarded by current physical-fitness standards required for the

private pilot's license. We will not burden the record with the many, many cases of pilots who despite physical handicaps requiring waivers to obtain their airman's licenses, have to our personal knowledge piloted aircraft safely and usefully for business and pleasure. No useful purpose would be served by detailing the accidents known to us personally where the "supermen" (physically perfect airmen by medical standards) have spattered women, children, aircraft and themselves over our countryside in avoidable accidents.

AOPA has a very keen interest in the matter of maintenance of medical standards which are realistic and effective but which at the same time will not burden the industry with unnecessary, expensive and cumbersome procedures. This interest is both altruistic and monetary. It is altruistic to the extent that we represent 65,000 plus bona fide pilots in all matters regarding their flight activities, and it is monetary from the viewpoint that we have two very large insurance programs for our members in which a deterioration of medical standards could have a very profound financial effect on our operation.

From this you will see that we must and have devoted considerable time and energy to determine what medical standards are required to maintain an adequate safety standard and yet at the same time to prevent establishment of theoretically desireable but unnecessary medical standards which would stunt the growth of and the proper expansion of the aviation industry in the public interest.

We pay an insurance premium on each and every member of the association, which covers only flying accidents. A member starts with a $700 death and dismemberment coverage and the amount increases by $100 of coverage each year of uninterrupted membership until a plateau of $1,000 is reached. A high percentage of our members are covered for $1,000. In addition there are medical benefits, which are probably not too germane to your interest. Having acquired a $1,000 policy automatically and as a part of their membership package, the member can then acquire up to $100,000 additional optional coverage. Limits up to $500,000 are also available through arrangements with Lloyd's. The premium volume for the casualty lines of insurance written by the American Mercury Insurance Co. under contract with the association is approximately three-fourths of a million dollars a year.

In a second plan of insurance known as the AOPA life plan, units of $5,000, $10,000, or $20,000 are available at the option of the individual member. This insurance has no aviation markup, and it is available "across the board" for a standard rate irrespective of age or type of flying being conducted; i. e., there are no exclusions for crop dusting, military jet flying, etc. This insurance is handled on an individual underwriting basis and each member is issued an individual contract of insurance, although the aggregate operation is treated as a group insofar as administration is concerned, and AOPA has in effect assured a level premium rate as above described. At the present, approximately $30 million of this life plan is in force and it is experiencing satisfactory growth, as in the case of the casualty (accident) insurance line, which at present amounts to about $1 million of additional insurance in force each month.

From the foregoing, I believe you can understand that we, with all due modesty, feel we are in a position to comment upon medical standards with some substantial degree of authority and experience and that our opinion in these matters is backed up by some pretty important and conclusive arithmetic.

We have very diligently searched all of the records, both within our own operation and other actuarial and Government sources available and we can find no shred of evidence which would justify either a tightening up of medical standards or creation of any new "air surgeon's office" or equivalent.

We have paid out through our insurance program many millions of dollars of benefits. If there were any step which appeared necessary from a study of the accident records and which would to any substantial degree reduce aircraft accidents involving fatalities and injuries, we would be the first to launch a vigorous campaign for such reform.

A statement by a doctor to the effect that waivers on physical fitness of experienced airmen due to normal ravages of age, were favored by the profession, is of interest. It can be assumed that the handicap waived, having been recognized by the individual—he will avoid situations with which he cannot cope. With this thinking, AOPA agrees, and by extending this thinking to the airman who is commencing to fly, we consider that he can, if he is properly motivated, equal or better the safety record of the "superman." It is understood that the AAA finds this philosophy set forth above to be true of the motorist.

There are far too many safety adjustments which can and should be made along other lines which will reduce fatal and serious injury accidents for us to give any serious consideration to the current proposals. If money is available from Government sources to the extent of that indicated in the medical proposals, it should certainly be quickly collared and put to work where it will really be productive and not piddled away on medical fantasy.

With respect to the requirements of increased basic medical knowledge, increased coordination between the Medical Division, Office of Aviation Safety of the CAA, and the military aviation research projects, and the distribution of such knowledge as may be determined to be a requirement for civil aviation by the Chairman of the CAB and the Administrator of the CAA; AOPA favors these actions as stated in my previous letter.

Cordially,

J. B. HARTRANFT, Jr., *President.*

We asked Dr. Stovall to come up to try and clear up some things for us.

Would you come forward, Doctor?

The mechanisms that were brought out in the testimony of Dr. Fenwick in regard to the CAB apparently initiating the proposed change for the lessening of the physical examinations, the number and the time required of all three classes of pilots: When we were talking with you yesterday I don't believe we got more than a rather general statement that there had been proposals to modify the medical examinations all of which had a tendency to make them a little less rigid, I believe is what you testified to.

I was wondering if the CAB circulated this information in which they report that about half the people flying, I think, liked the ideas. We were wondering if they showed proper respect for the position of the CAA Department of Medicine in this matter?

Dr. STOVALL. Mr. Chairman, we were asked to comment on the proposals the same as any other group would be as an interested party.

Senator MONRONEY. The same; you were not given a better standing in regard to these recommendation than just some other association of doctors?

Dr. STOVALL. I don't believe that we were given any more consideration than any other group that would have an opinion. We did make our comment. I have a copy of the comment, particularly with respect to the presbyopia; I understand that is what I was expected to report on. I have that with me. I will be glad to give you our position.

Senator MONRONEY. We would like to have your position on all the changes, first the length of time between the examination; secondly, the depth perception and——

Dr. STOVALL. Our position was in three parts, so to speak, with respect to presbyopia. We felt that since the proposals were entirely inconsistent with accepted medical practices that we could not support a lengthening of the time period, rather we proposed a shortening of the 3-year interval—I mean third class to a 1-year interval to make it consistent with the usually accepted 1-year period in other forms of industry.

We did this in order to do two things: one to pick up in their incipiency conditions that might be developing between examinations, and secondly, in order to pick up missed conditions. It isn't always possible to find everything that is coming on.

Now, that is our reason for taking the stand that we do on 1-year examination.

With respect to the standards themselves we disqualified ours in this respect, that we have requested the Flight Safety Foundation to make this study that has been referred to sometimes during the meeting here. Since there is no record of authoritative studies that would tend to establish standards we asked that the matter of a change of standards be deferred until such time as this study is in.

The third part of our position dealt with maters that had nothing to do either with time or with the standards themselves and that was this matter of whether a defect would or would not interfere with the safe piloting of aircraft. We are expected in each individual case to demonstrate that a particular defect will interfere with the safe piloting of an aircraft and we believe that that is a medical impossibility.

We think that we should be required only to show that there would be reasonable probability that the defect would cause incapacity.

That is a summary of the position that we took on the proposal, sir.

Senator MONRONEY. And the CAB change has been held up pending the outcome of these studies?

Dr. STOVALL. It has been deferred. I don't know the reason for deferring it, sir.

Senator MONRONEY. But it came out about a year ago?

Dr. STOVALL. The date of comment was June 5 of 1956 with a deadline for comment. I guess I do have a copy of the proposal. Yes, February 29, 1956.

Senator MONRONEY. Do you have a copy of the proposal and a copy of the CAA's letter?

Dr. STOVALL. I do.

Senator MONRONEY. There will be no objection to putting that in the record at this point?

Dr. STOVALL. Not at all, because it is now a public record.

Senator MONRONEY. It will be inserted in the record at this point.

(The document referred to follows:)

CIVIL AERONAUTICS BOARD,
BUREAU OF SAFETY REGULATION,
Washington, D. C., February 29, 1956.

CIVIL AIR REGULATIONS DRAFT RELEASE NO. 56-6

Subject: Physical standards for airmen (medical certificates).

The Bureau of Safety Regulation has under consideration a proposed revision of Part 29 and an amendment to Part 43 of the Civil Air Regulations. The reasons therefor are set forth in the explanatory statement of the attached proposal which was published today in the Federal Register as a notice of proposed rule making concurrently with the issuance of this draft release.

The Bureau desires that all persons who will be affected by the requirements of this proposal be fully informed as to its effect upon them and is therefore circulating copies in order to afford interested persons ample opportunity to submit to the Bureau such comments as they may desire.

Because of the large number of comments which we anticipate receiving in response to this draft release, we will be unable to acknowledge receipt of each reply. However, you may be assured that all comment will be given careful consideration.

It should be noted that comments must be submitted in duplicate and in order to insure consideration must be received by the Bureau not later than June 5, 1956.

JOHN M. CHAMBERLAIN,
Director, Bureau of Safety Regulation.

[As published in the Federal Register (21 F. R. 1326), February 29, 1956]

CIVIL AERONAUTICS BOARD

[14 CFR Parts 29, 43]

PHYSICAL STANDARDS FOR AIRMEN (MEDICAL CERTIFICATES)

NOTICE OF PROPOSED RULE MAKING

Pursuant to authority delegated by the Civil Aeronautics Board to the Bureau of Safety Regulation, notice is hereby given that the Bureau will propose to the Board a revision of Part 29 and an amendment to Part 43 of the Civil Air Regulations in substance as hereinafter set forth.

Interested persons may participate in the making of the proposed rules by submitting such written data, views, or arguments as they may desire. Communications should be submitted in duplicate to the Civil Aeronautics Board, attention Bureau of Safety Regulation, Washington 25, D. C. In order to insure their consideration by the Board before taking further action on the proposed rules, communications must be received by June 5, 1956. Copies of such communications will be available after June 8, 1956, for examination by interested persons at the Docket Section of the Board, Room 5412, Department of Commerce Building, Washington, D. C.

Currently effective Part 29 of the Civil Air Regulations prescribes the physical standards airmen must meet for the particular class of airman's certificate applied for and provides for the waiver of those standards under specified conditions.

Currently effective § 43.41 of Part 43 of the Civil Air Regulations requires personal possession of an appropriate medical certificate while piloting aircraft and prescribes time limits for the renewal of the medical certificate.

The proposed revision of Part 29 simplifies and clarifies the requirements for the issuance of medical certificates, particularly in those cases where the physical standards for the First, Second, and Third Classes cannot be met by the applicant, and it includes the most recent findings of medical authorities on appropriate physical standards for airmen.

Although Part 29 presently is entitled "Physical Standards for Airmen," the part, in effect, establishes the standards for the issuance of medical certificates; hence, it is proposed to rename the part "Medical Certificates" to describe more realistically the function of the part.

The currently effective visual-acuity requirement for First and Second Class medical certificates is 20/20. However, it is recognized that in many instances a person with 20/30 vision can operate more effectively without glasses than he can with them due to restriction of the field of vision, and dirt and condensation on the lenses. Moreover, the medical standards developed at a recent meeting of the International Civil Aviation Organization, with which the United States has concurred, retains a visual-acuity requirement of 20/30 which has been the ICAO standard for these classes of certificates. In view of these considerations this revision contains a 20/30 visual-acuity requirement for both First and Second Class certificates.

With respect to the heterophoria and depth perception tests, it is considered that they should be deleted because there is no evidence that they measure a pilot's ability either to read his maps and instruments, or to make the other necessary observations outside of the airplane. This view is further supported by the fact that the majority of the medical experts who attended the recent meeting in Paris were of the opinion that the above-mentioned tests should no longer be taken into account in determining flight ability. The United States experts who attended this meeting concurred with this conclusion.

Current hearing provisions require applicant to hear the whispered voice at certain distances prescribed for the class. Medical experts recommend that the spoken voice be substituted for the whispered voice since different frequencies are involved and the whispered voice is not used in airplane communication. Accordingly, an initial spoken voice test is proposed with provision for those failing this test to take an audiometer or flight test.

Present provisions with respect to the nervous system require that applicant have no disease of the mental or nervous system. To resolve possible uncertainty that these provisions are to be conditioned by the general requirement that no applicant shall have an organic or functional disease which would interfere

with the privileges of his airman certificate, and because medical authorities advise that any disease of the nervous system must be either organic or functional, it is proposed that consideration of mental or nervous disease be included in the General Physical Condition provisions. However, it is proposed that applicants be put on notice that a bona fide history of psychosis or epilepsy or an established diagnosis of diabetes requiring insulin treatment or of coronary heart disease is considered disqualifying for a medical certificate since medical examiners for the Civil Aeronautics Administration have determined that any of these conditions would certainly affect safety of flight.

It appears that an undue burden is imposed on the Administrator by requiring that he determine whether an applicant's operational record, ability, and judgment as an airman compensate for a known physical deficiency. It is proposed therefore, that a limited medical certificate be issued, at the discretion of the Administrator, in lieu of consideration of a waiver of physical standards (§ 29.5) where it is demonstrated by more extensive medical examination that the applicant's physical deficiency would not interfere with the safe performance of those privileges of his airman certificate that he is authorized to perform. The proposed issuance of a limited medical certificate would clarify the grounds on which an applicant might have special consideration in case of an otherwise disqualifying physical deficiency since the standard would be safe performance of privileges rather than the intangible criterion of skill, experience, and judgment compensating for a physical deficiency. Such proposed procedure would more nearly accord the provision of section 602 (b) of the Civil Aeronautics Act of 1938 which requires issuance of an airman's certificate where applicant "possesses proper qualifications for, and is physically able to perform the duties pertaining to, the position for which the airman certificate is sought" since the Administrator could issue an appropriate limited medical certificate even in those cases where the applicant had a non-compensatory physical deficiency for which no amount of experience or judgment would compensate.

The Accident Analysis Division of the Bureau of Safety Investigation advises that there is little or no correlation between the issuance of waivers for physical deficiencies and aircraft accidents.

With respect to frequency of physical examinations (§ 43.41), a check of past records concerning the effective dates of medical certificates indicates that the specific periods of time between medical re-examinations, currently effective, are arbitrary and appear to be a compromise of opinions of various experts in the field who differ widely among each other. In determining an appropriate interval for physical re-examination, the following factors were considered: (1) The percentage of accidents attributable to the physical fitness of the pilot, and (2) the percentage of applicants for re-examination who fail to meet the physical requirements.

An analysis was made of the CAA records of denials of Class I and Class II medical certificates during 1953 and 1954 according to the age of the applicants and the pathological cause. In approximately 23,000 Class I physical re-examinations per year there were 12 denials in 1953 and only 4 in 1954. Out of about 68,000 Class II re-examinations, there were 46 denials in 1953 and 42 in 1954. This would indicate that out of approximately 90,000 re-examinations per year there were 58 denials in 1953 and 46 in 1954. This is equivalent to one denial for every 1,700 re-examinations, or one in every 3,000 Class I re-examinations and one in every 1,545 Class II re-examinations.

A further analysis of the record discloses that of the 12 Class I denials in 1953, only 4 were rejected because of the type of deficiencies that might cause sudden incapacitation and all of those were over 40 years of age. There were no applicants under 30 years of age denied a certificate in either year. On this basis it appears reasonable to extend the re-examination period of Class I medical certificates to 2 years for those under 40 years of age, and to 1 year for those 40 years of age and over.

There were about six times as many applicants for Class II as Class I certificates and about five times as many denials indicating a fairly close relation between denials per year per pilot for both classes. Of the 46 denials in 1953, only 15 were based on pathological conditions that might indicate a likelihood of sudden incapacitation and only 6 of these applicants were under 40 years of age. Considering these 15 cases in relation to the almost 68,000 re-examined, there is no apparent reason why the Class II re-examination period should not be extended to 3 years for those pilots under 40 years of age, and 2 years for those 40 years of age and over.

We do not have a record of the Class III denials but, due to their much lower standards, there is every reason to believe that the ratio is even smaller than for the other two classes. Consequently, re-examination every 5 years up to age 40 and every 3 years thereafter should provide adequate assurance of physical fitness for purposes of safety. These recommended medical re-examination intervals are made with full cognizance of the fact that CAA medical examiners now have the authority to decrease the length of time between re-examinations, at their discretion, if the physical fitness of the applicant indicates this precaution.

In view of the foregoing, notice is hereby given that it is proposed to revise Part 29 and amend Part 43 of the Civil Air Regulations:

1. By revising Part 29 to read as follows:

PART 29—MEDICAL CERTIFICATES

Sec.
29.1 Issuance of medical certificates.
29.2 First class.
29.3 Second class.
29.4 Third class.
29.5 Physical deficiencies.

§ 29.1 *Issuance of medical certificates.* A medical certificate of the appropriate class shall be issued by the Administrator or his authorized representative to an applicant who meets the physical requirements prescribed in this part.

§ 29.2 *First class*—(a) *Vision.* Applicant shall have:

(1) A visual acuity in each eye without correction of at least 20/30, or a visual acuity in each eye without correction of at least 20/60 correctable to 20/30 in which case the applicant must wear correcting lenses while exercising the privileges of his certificate.

(2) Normal fields of vision.

(3) The ability to distinguish aviation signal red, aviation signal green, and white.

(4) An accommodation of at least V=1.00 at 18 inches with or without correction.

(b) *Hearing.* Applicant shall be able to hear the average conversational voice in a quiet room at a distance of 20 feet with each ear: *Provided*, That the applicant may qualify if his hearing loss in either ear is not more than 40 decibels at 256, 512, 1,024, and 2,048 cycles per second, or if he demonstrates that he can hear speech and radio signals against a background noise which represents the masking properties of aircraft cockpit noise.

(c) *General physical condition.* (1) Applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe performance of the privileges of his airman certificate. Any significant structural defect or limitation shall be noted on the medical certificate.

NOTE: A bona fide history of psychosis or epilepsy, or an established diagnosis of diabetes requiring insulin treatment or of coronary heart disease shall be considered disqualifying under this section.

(2) Unless the adjusted maximum readings apply, applicant's reclining blood pressure shall not exceed the maximum readings for his age group, as indicated in the following table. The adjusted maximum readings shall apply to any applicant, age 30 years or more, whose reclining blood pressure exceeds the maximum readings for his age group and whose cardiac and kidney conditions, after complete cardiovascular examination, are shown to be normal.

Age group	Maximum readings (reclining blood pressure in mm.)		Adjusted maximum readings (reclining blood pressure in mm.)	
	Systolic	Diastolic	Systolic	Diastolic
20–29	140	88		
30–39	145	92	155	98
40–49	155	96	165	100
50 and over	160	98	170	100

§ 29.3 *Second class*—(a) *Vision.* Applicant shall have:

(1) A visual acuity in each eye without correction of at least 20/30, or a visual acuity in each eye without correction of at least 20/100 correctable to 20/30 in which case the applicant must wear correcting lenses while exercising the privileges of his certificate.

(2) Normal fields of vision.

(3) The ability to distinguish aviation signal red, aviation signal green, and white.

(4) An accommodation of at least V=1.50 at 18 inches with or without correction.

(b) *Hearing.* Applicant shall be able to hear the average conversational voice in a quiet room at a distance of eight feet with each ear: *Provided*, That the applicant may qualify if his hearing loss in either ear is not more than 50 decibels at 256, 512, 1,024, and 2,048 cycles per second, or if he demonstrates that he can hear speech and radio signals against a background noise which represents the masking properties of aircraft cockpit noise.

(c) *General physical condition.* Applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe performance of the privileges of his airman certificate. Any significant structural defect or limitation shall be noted on the medical certificate.

NOTE: A bona fide history of psychosis or epilepsy, or an established diagnosis of diabetes requiring insulin treatment or of coronary heart disease shall be considered disqualifying under this section.

§ 29.4 *Third class*—(a) *Vision.* Applicant shall have:

(1) A visual acuity in each eye without correction of at least 20/40, or a visual acuity in each eye without correction of at least 20/400 correctable to 20/40 in which case the applicant must wear correcting lenses while exercising the privileges of his certificate.

(2) The ability to distinguish aviation signal red, aviation signal green, and white.

(b) *Hearing.* Applicant shall be able to hear the spoken voice at four feet.

(c) *General physical condition.* Applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe performance of the privileges of his airman certificate. Any significant structural defect or limitation shall be noted on the medical certificate.

NOTE: A bona fide history of psychosis or epilepsy, or an established diagnosis of diabetes requiring insulin treatment or of coronary heart disease shall be considered disqualifying under this section.

§ 29.5 *Physical deficiencies.* (a) A limited medical certificate shall be issued to an applicant who fails to meet the physical standards prescribed for the class of certificate sought if the Administrator finds, through more extensive medical examination, practical test, or otherwise, that the applicant's physical deficiency would not interfere with the safe performance of those privileges of his airman certificate that he is authorized to exercise.

(b) Where the Administrator's finding regarding an individual's physical fitness is based upon a practical test, that individual will not be required to retake such practical test during subsequent physical examinations unless, in the opinion of the Administrator, the individual's physical deficiency has become more pronounced.

2. By amending § 43.41 to read as follows:

§ 43.41 *Medical certificate and renewal.* No person shall pilot an aircraft under authority of a pilot certificate issued by the Administrator unless he has in his personal possession at all times while piloting aircraft a medical certificate or other evidence satisfactory to the Administrator showing that he has met the physical requirements appropriate to his certificate within the following time limits:

(a) *First class*—(1) *Airline transport pilot privileges.* (i) Under 40 years of age, 2 years.

(ii) 40 years of age and over, 1 year.

(2) *Commercial pilot privileges.* (i) Under 40 years of age, 3 years.

(ii) 40 years of age and over, 2 years.

(3) *Student or private pilot privileges.* (i) Under 40 years of age, 5 years.

(ii) 40 years of age and over 3 years.

(b) *Second class*—(1) *Commercial pilots privileges.* (i) Under 40 years of age, 3 years.

(ii) 40 years of age and over, 2 years.
(2) *Student or private pilot privileges.* (i) Under 40 years of age, 5 years.
(ii) 40 years of age and over, 3 years.
(c) *Third class*—(1) *Student or private pilot privileges.* (i) Under 40 years of age, 5 years.
(ii) 40 years of age and over, 3 years.

This revision and amendment are proposed under the authority of Title VI of the Civil Aeronautics Act of 1938, as amended, and may be changed in the light of comments received in response to this notice of proposed rule making.

(Sec. 205, 52 Stat. 984; 49 U. S. C. 425. Interpret or apply secs. 601–610, 52 Stat. 1007–1012, as amended; 49 U. S. C. 551–560)

Dated at Washington, D. C., February 23, 1956.
By the Bureau of Safety Regulation.

JOHN M. CHAMBERLAIN,
Director.

[F. R. Doc. 56–1538; Filed, Feb. 28, 1956; 8:51 a. m.]

CIVIL AERONAUTICS ADMINISTRATION,
June 5, 1956.

To: Director, Bureau of Safety Regulation, B–80.
From: Director, Office of Aviation Safety.
Subject: Civil Air Regulations Draft Release No. 56–6.

The following comments are submitted with respect to the draft proposals contained in Civil Air Regulations draft release No. 56–6, dated February 29, 1956. This release is concerned with the revision of part 29 and amendment of part 43 of Civil Air Regulations. The changes concern:

I. Physical standards

(1) Reduction in acceptable test scores for visual requirement.
(2) Deletion of text referring to disease conditions of eye, ear, nose, throat, and nervous system.

Summary comment: Do not concur.
Reasons: Aviation safety.
(*a*) Has recognized the need for a comprehensive and authoritative study of physical standards;
(*b*) Has developed an orderly plan for such a study; and
(*c*) Is currently negotiating for a contract with the Flight Safety Foundation for this work with funds to the extent of $100,000 appropriated by the Congress for this purpose. In consequence, the professional medical staff has been reluctant to recommend expedient measures, anticipating the considered conclusions of the study which may be expected to provide a factual rather than arbitrary basis for action. The changes proposed appear to have been selected arbitrarily. For example, the draft proposes changes in the numerical values for visual acuity, deletion of phorias and of depth perception testing, although these are consistent with ICAO recommended practices. However, we are reluctant to extract single provisions from a code of standards without subjecting the item to critical analysis on the basis of accepted medical criteria.

II. Method of physical measurement

Substitution of "average conversational voice" for "whispered voice" in screening tests for hearing acuity.

Summary comment: No objection.
Reason: This is only a gross qualitative method for screening of applicants for more definitive testing.

III. Administrative

(1) Change in title of part 29.
(2) Clarification of denials for certain organic disease conditions.
(3) Proposal of a "limited certificate" in lieu of "waiver of physical standards."

Summary comment:
(1) No objection.
(2) Accept with modifications, i. e.:

(i) That the four conditions—epilepsy, psychoses, coronary heart disease, diabetes—listed as disqualifying under each class (sec. 29.2 (c), 29.3 (c), 29.4 (c)), be considered as disqualifying for a limited medical certificate (sec. 29.5 (a));

(ii) That diabetes be considered as disqualifying whether or not insulin therapy is required; and

(iii) That consistency of intent be established by use of "may" rather than "would" when referring to the consequences of physical deficiencies in sections 29.2 (c), 29.3 (c), and 29.4 (c).

(3) Concur, with modifications described in III (2) above.

Reasons:

(*a*) These conditions can cause sudden incapacity without sufficient advance warning to the applicant to permit safe relinquishment of the controls. This lack of warning would be due to the total absence of preliminary symptoms or to the applicant's inability to recognize impending physical failure due to a clouding of his mental processes. Under such conditions he could not reasonably be held responsible for noncompliance with section 43.42 of Civil Air Regulations, Operation During Physical Deficiency. Even though at the time of his physical examination he might be regarded as physically qualified, the results of medical examination are not so precise as to permit an accurate estimate of the exact time of future occurrence of total disability. It can only be stated that the likelihood of occurrence of sudden total disability in these conditions is very great.

(*b*) There is no way to insure that the unscrupulous applicant will not obtain medical certification while taking insulin, and the conscientious applicant may omit insulin in order to obtain medical certification, thus endangering himself and others. Suddenly incapacitating complications resulting from diabetes in any grade of severity or associated with the disease, regardless of the adequacy or manner of treatment, occur with sufficient frequency as to be a hazard to safe flight. Coronary heart disease, alone, occurs 6 to 8 times more frequently in diabetics than in persons who do not have diabetes.

(*c*) The use of the phrase "may interfere" in connection with the issuance of unlimited medical certificates and of "would not interfere" in connection with limited medical certificates indicates reasonable likelihood of interference rather than the connotation of certainty of interference. The limitations imposed on the limited medical certificate are designed specifically to preclude the development of dangerous situations due to physical deficiency.

IV. Periodicity

Increase intervals between examinations for all classes according to two age groups.

Summary comment: Do not concur.

Reasons: These proposals are clearly inconsistent with accepted medical practices, which dictate that the period between physical examinations should not exceed a maximum of 1 year. Accordingly, we would propose the alternative of reducing the interval for third-class medical certificates to 1 year, in order that defects missed at the earlier examination and intercurrent physical defects and diseases can be detected and the proper action taken. Medical Division third-class medical records are replete with reported conditions that are disqualifying, but which could have been corrected and the applicant medically certificated had they been reported earlier. The periodicity requirements for the other classes should remain unchanged.

Recommendations: It is recommended:

(1) That the current physical standards be allowed to remain unchanged pending the development of an authoritative factual basis for their improvement; and

(2) That section of the alternative proposal which deals only with administrative and interpretative aspects of the Civil Air Regulations, part 29 and part 43, be considered for adoption at this time; and

(3) That the alternate proposal to establish a yearly examination for third-class certificates and to continue without change the present frequency of examination of first class and second class be adopted.

The recommended actions are embodied in the attached modification of your draft proposal.

(s) OMER WELLING.
WILLIAM B. DAVIS, W–200.

Senator MONRONEY. We wanted to identify and clarify this matter which did come out this morning in the examination; we did not get the full impact of it yesterday.

Well, Doctor, if you will leave those for the record we will appreciate it and we thank you for coming up here to help us clarify that.

Is there any other witness that wishes to be heard, from organizations or aviation groups?

The committee stands in recess until 10 o'clock tomorrow morning at which time we will meet in this room.

The committee is recessed.

(Thereupon, at 12:20 p. m., the subcommittee was adjourned, to reconvene at 10 a. m., Wednesday, April 3, 1957.)

CIVIL AVIATION MEDICINE

WEDNESDAY, APRIL 3, 1957

UNITED STATES SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D. C.

The subcommittee met, at 10:05 a. m., in room F–39, United States Capitol, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The subcommittee of the Senate Interstate and Foreign Commerce Committee will be in order.

We were working yesterday on S. 1045, a bill to provide for a Surgeon General and revise the medical services of the Civil Aeronautics Administration. We were unable to get the testimony of Mr. Sayen, the president of the Airline Pilots Association. He is here today and while we are waiting for the other members to hear S. 1474, the all-cargo bill, I believe we will ask Mr. Sayen to come forward and introduce his statement into the record and he can read it if he would like or comment on it if he would care to.

We welcome you also to this committee and appreciate the value of the benefit of your advice.

STATEMENT OF C. N. SAYEN, PRESIDENT, AIRLINE PILOTS ASSOCIATION

Mr. SAYEN. Thank you, Senator.

I am very happy to be here and have an opportunity to testify on this legislation before the commitee. We have a statement that has been addressed to the committee in the form of a letter. We were not sure it would be possible to appear on this.

The letter is largely self-explanatory. If it is agreeable with the committee, I would just summarize the contents of the letter and maybe expand on it a little bit.

Senator MONRONEY. Fine.

Mr. SAYEN. We oppose this legislation in its present form. We do not oppose research in the aviation medical field, but we feel this particular bill goes far beyond the needs for legislation in the aeromedical field at this time. This bill would change the entire system of evaluating the medical condition of airmen; it would do away with the hearing procedures and protections now provided in the act and would substitute therefor arbitrary authority on the part, largely, of one individual. We oppose that.

On the other hand, this bill would encourage research in the aeromedical field in problem areas that may appear and that we would support, if it was put forth in some other manner than set forth in this legislation.

We feel that, under existing legislation in the Civil Aeronautics Act, such research may be conducted and if proper programs were brought before the Congress by the existing agencies charged with the responsibility for medical standards then the Congress could act on those programs individually.

That could be brought in either as part of the program of the Civil Aeronautics Administration or the Civil Aeronautics Board and brought in in their appropriations.

Senator MONRONEY. In other words, they would have to justify each type of research that they were doing so the Congress would still be able to measure the extent of the research program.

Mr. SAYEN. That is correct.

Senator MONRONEY. And the need for that particular thing.

Mr. SAYEN. That is right. Briefly, we feel that the protections that are provided for the public and for the licensed airmen and other people who are required to undergo medical examinations in the present bill are necessary and should be continued.

This is the procedure by which the Federal Government conducts the examination and there is a right to review of the Government examiners' findings through legal processes, finally winding up in a hearing before the Civil Aeronautics Board. We feel those protections are essential.

Medical standards change rather rapidly and it gives the individual who may feel that he has been wronged in a medical case an opportunity to bring outstanding medical authorities to testify before the Civil Aeronautics Board or the Civil Aeronautics Administration examiners to bring new evidence to bear and to secure a hearing on his particular problem.

Now, in connection with this medical standard business, if I could, I would like to make 1 or 2 statements.

From time to time there are problems raised in connection with pilot medical standards which would seem to imply that the present standards are deficient in providing for public air safety. My organization investigates all major air carrier accidents and participates with the Civil Aeronautics Board in the investigation of all major carrier accidents. There has never been an air carrier accident in which the physical breakdown of the pilot has been given as a cause or a contributing cause.

Now, I don't believe that can be said for almost any other component of the aircraft—that there has never been an accident attributed to the failure of the medical standards to this date.

Senator MONRONEY. The misconception perhaps derives from the fact that oftentimes they say 90 percent of the accidents are due to pilot failure or high percentages that they quote which does not mean medically, but would mean the pilot's snap judgment at the critical moment was that he should go left when maybe he should go right or increase his motor speed or cut it.

I mean, it is a matter of human judgment in that split-second timing when the fraction of a second is a difference; is that not correct?

Mr. SAYEN. That is right. You have to distinguish between medical standards which measure the medical abilities of the person and questions of judgment or questions of performance. We measure judgment and performance by different standards than we measure

the medical ability of the individual, but there has never been an accident where it is said that the man's heart failed at a critical time or that the man's arm was too short to reach the required gadget or that his appendix burst or some such thing in flight and that resulted in an accident. There has never been such an accident.

Senator MONRONEY. Of course, you never can be absolutely sure, can you, because there are no autopsies that have been performed on these pilots if you have a crash.

Mr. SAYEN. Well, the aeromedical people, to the best of my knowledge, have never been able to establish any such——

Senator MONRONEY. Any evidence that would presume that there was a failure in the heart condition or stroke or anything of that kind?

Mr. SAYEN. Now, we have never advocated that the present system of examination for airmen should be made more lenient than it presently is.

The Civil Aeronautics Board came up with a proposal for industry discussion about 9 months ago in which they suggested that the period between physical examinations for airmen be lengthened. We oppose that; we feel that a recurring physical examination is a good thing.

Senator MONRONEY. You want to take it at the same time, which is what you have always taken it, twice a year, is it not?

Mr. SAYEN. For an air transport pilot a physical every 6 months, and for a commercial pilot who may serve as a copilot it is once a year, that is regardless of age. The proposal was that we make certain age differentiations. We have found no basis for age differentiations. For that matter, we have just completed a 2-year research on this study and found there is no relationship between chronological age and physical condition or performance. We think that is a misconception that has been foisted on the aviation industry over the years by the picture years and years ago that a pilot should be an intrepid young person of unusual endurance and daring, we feel that airline pilots or professional pilots should be the opposite, they should be mature men of good judgment, not people of exceptional daring and endurance.

I think sometimes under some of our working conditions we would also operate under the impression that we should be people of outstanding endurance and youth, and so forth, that is not the kind of people you want to ride behind in an airplane. We want mature people of good judgment and you might be interested to know that there are currently flying in commercial air transportation 17 pilots who are 60 years of age and over, who are flying schedules every day and doing so reliably. They pass a physical examination every 6 months, they take a competency examination every 6 months, and they have no difficulty with either. If they fail either, of course, at any age, then their career is ended.

Senator MONRONEY. Well, the question is not of age, but of fitness and a man can be just as disabled at 40 as he could be at 60.

Mr. SAYEN. That is right, this is the only profession, I believe, in our society where a man's competency has to be checked every 6 months and actually is checked more often than that, and where his physical condition is checked every 6 months and with such checks,

which we don't have in any other profession, then chronological age is not a factor.

Senator MONRONEY. Have you ever set any ceiling on the limits of age for pilots?

Mr. SAYEN. It is the point at which he may no longer pass his physical examination, meet the physical requirements or where he no longer possesses the competency to do his job. That may come at any age, that may come at 30, 40, 50, or 60, we don't know yet.

Senator MONRONEY. There is no way to set a physical age limit which pilots can't go beyond? We set 70 for postmasters, they can't serve 1 day past 70.

Mr. SAYEN. I imagine you will find many postmasters at 70 who are more competent than many postmasters at 40.

Senator MONRONEY. But that is the rule.

Mr. SAYEN. I think there is a growing feeling in industry as we accumulate more experience on this ageing business that chronological age is a very poor measure of competency or physical condition. That is true for pilots in our studies, very definitely for pilots from our studies.

Senator MONRONEY. Is there any difference in the competence and speed of reflexes and all when you get into these jets? Now, will not the seniority of the pilots have a lot to do with who gets the fast, who gets continental jet runs?

Mr. SAYEN. We have been doing a lot of studies in that field and I am happy to have a comment on it.

We have not been able to determine that there would be any different physical requirements for pilots operating jet aircraft than for pilots operating present-day aircraft. The biggest requirement for the operation of jet aircraft that we can find is that you maintain a high level of piloting experience in the cockpit. It is not a job to be done by an amateur or a person of limited training. But the problems that we will cope with in operating jet transport aircraft are the type of problems that can well be met by a man of long experience in the flying business, navigational problems, communication problems, flight planning problems, air traffic control problems, those problems which will be the most aggravated as far as this business of the physical operation of the airplane and his landings, takeoffs, maneuvers, and so forth. We see no physical problem different from that of operating present-day aircraft.

I think the military experience may be similar, that they try to get their people of the greatest experience into their heavy transport-type, bomber-type aircraft.

Senator MONRONEY. Senator Bible, do you have any questions?

Senator BIBLE. I have no questions, Mr. Chairman.

Senator MONRONEY. Mr. Baynton.

Mr. BAYNTON. Just one.

Mr. Sayen, did your organization take a position with respect to these proposed changes in standards that the Civil Aeronautics Board circulated almost a year ago?

Mr. SAYEN. Yes.

Mr. BAYNTON. With respect to the lowering of the sight requirements?

Mr. SAYEN. We oppose it. We opposed any lowering of the vision requirements; we opposed any lengthening of the period between physical examinations.

Senator MONRONEY. It has been testified here yesterday to the fact that sometimes the CAB overrode the advice of medical examiners on denying certificates of airworthiness to candidates. On cross-examination by the committee it was developed, however, that there were no cases that they could show in the air-transport field; therefore, it was apparent what waivers had been obtained by the CAB had been on findings that had been made on private pilots. You feel that was a proper statement of fact that the rigid enforcements and rigid observance of the medical findings do obtain in regard to your transport-pilot examinations?

Mr. SAYEN. Yes; my testimony here is primarily with regard to airline pilots, the air-transport pilots; and we have found that if you are going to appeal a decision of a CAA examiner on a medical problem to the Civil Aeronautics Board you have to be prepared to bring before the Board the best medical testimony available in the country today that enables you to have your man with the problem probably go to the Mayo Clinic or Johns Hopkins or to the University of Michigan or to the outstanding specialists in that particular field today and bring them in before the Civil Aeronautics Board and have them produce whatever testimony they have and secure judgment based on that, though I think there is ample opportunity to get the best medical advice available in connecton with these cases.

At least, that has been our experience; that is the only way we have ever been able to process a case before the CAB on these matters.

Senator MONRONEY. Senator Smathers, we were just finishing up this health bill that we had when you came in, before we started on this other, and you have a statement, I think, from Mr. Sayen. I don't know whether you wanted to ask him any questions or not.

Senator SMATHERS. No; thank you, Mr. Chairman; I am just reading this statement; that will be sufficient for me.

(Mr. Sayen's written statement follows:)

AIR LINE PILOTS ASSOCIATION,
Chicago, Ill., April 2, 1957.

Hon. A. S. MIKE MONRONEY,
Chairman, Subcommittee on Transportation,
Senate Interstate and Foreign Commerce Committee,
United States Senate, Washington 25, D. C.

DEAR SENATOR MONRONEY: The purpose of this letter is to acquaint you with the views of the Air Line Pilots Association on Senate bill 1045 which is currently being considered by your committee. As you are aware, this bill and its companion, H. R. 4275, would amend the Civil Aeronautics Act of 1938 to provide that an office of civil aviation medicine be established. This office would be given extensive powers both with respect to minimum physical and mental requirements and also the establishment of a civil medical research facility.

This association is of course very much interested in the problem of physical standards for airline pilots both in the public interest and personal view. For the past several months we have conducted a very comprehensive study of problems in the medical field as they affect the safety of our air transportation. Our findings indicate that most of our present problems can be attributed to the manner in which procedures provided under the present law are utilized. While it must be admitted, for example, that there is always a great need for proper medical research in the civil area, it is believed that under present statutory provisions this objective can be accomplished. The only stumbling block resides in the lack of appropriation and proper emphasis on the problem.

In view of the aforegoing generalizations, the Air Line Pilots Association is opposed to S. 1045 for the following specific reasons:

1. Under the present statutory provisions, the Civil Aeronautics Board is afforded broad responsibilities with respect to all matters affecting aviation and it is believed that the language is sufficiently flexible to provide the necessary research and revision to existing physical and mental standards. Simply stated, it does not make good sense to charge the Board with the responsibility for proper development of the aviation industry and then restrict their activities by law in an important field such as the medical area.

2. The bill as proposed would remove the authority of the Civil Aeronautics Board to establish minimum physical standards for airmen and minimum human requirements in aircraft design. This authority would be vested in the Civil Air Surgeon who would be specifically charged with the responsibility for promulgating regulations in the following areas:

(*a*) Establishing minimum standards of mental and physical fitness for civil airmen;

(*b*) establishing minimum human requirements in aircraft design;

(*c*) providing for medical examinations of civil airmen by medical designees or other medical examiners; and

(*d*) providing for the issuance of medical certificates to civil airmen for the amendment, suspension, or revocation of such certificates.

All of the foregoing areas are currently the responsibility of the Civil Aeronautics Board and the method for satisfactory treatment of these problems is available at the present time.

3. While medical considerations are an important and highly specialized part of the total air safety problem, they are only a part and it is not believed that the overall interest could be best served by emasculating the central authority of the Civil Aeronautics Board. This thinking, if carried to the extreme, would result in independent agencies for meteorology, powerplants, air traffic control problems, and so on. Eventually we would again find ourselves in the position of requiring a central agency charged with the responsibility of proper development and coordination in the various fields. Consequently, it appears to us that our purpose would be better served under the existing framework with proper budgetary considerations for important projects.

4. The bill does not provide procedural safeguards such as those provided under present law. For example, the proposed amendment provides no means whereby the decision of the Civil Air Surgeon can be reviewed. Consequently, any individual who might feel himself injured by the decision of the Civil Air Surgeon does not have any appeal provisions available to him. We believe this constitutes a serious inroad on the civil rights of any individual so affected.

5. While, as indicated previously, there appears to be a definite need for research orientated toward civilian needs, particularly in the human engineering field, it is believed that such research could be conducted under present statutes. The problem in this area seems to be primarily one of appropriation and aggressive administration and not additional legislation.

In summation, it is our view that the purpose for which this bill was introduced could be more appropriately and expeditiously accomplished in accordance with the lines of responsibility as outlined in the present act. We simply are not confident that the creation of a separate Government bureau would assure more aggressive administration of industry objectives than that which could be accomplished under present procedures by simply appropriating necessary funds for the agencies already established to pursue the objectives. In fact, experience would dictate the latter course.

We appreciate this opportunity to comment upon the proposed legislation and wish to assure you that we will assist the committee in any manner possible to arrive at a proper solution to the proposed amendment.

With best regards, I am

Sincerely yours,

CLARENCE N. SAYEN, *President.*

Senator MONRONEY. Any further questions?

We have a statement from the Board of Osteopathetic Examiners of the State of Nevada, addressed to Senator Bible, dated March 30, 1957:

I understand the civil aviation medical bill, S. 1045, will be subject to hearings before your aviation subcommittee April 1 and 2.

The basic definition of "medical examiner" on page 3 of the bill restricts qualification to doctors of medicine. Such a restriction is unrealistic, and we are confident that you will obtain such revision of the language as will bring the measure into step with other Federal medical legislation which deals with doctors of medicine and doctors of osteopathy without discrimination.

Corrective amendments will be submitted by a witness for the American Osteopathic Association.

The mental and physical health of airmen is fraught with public interest, and the American Osteopathic Association will continue to cooperate for advancing programs calculated to promote this public interest.

Signed, Walter J. Walker, D. O.

We have had testimony from the Osteopathic Association. Mr. Lawrence Gourley, legal counsel, testified, I believe, on the opening day and presented a statement for the national organization. We are glad to have this from the association in Nevada.

If there are no further questions of Mr. Sayen on this point, we will ask you to stand aside, and I think you are going to remain and be available for testimony on this later bill; are you not?

Mr. SAYEN. Yes, sir; that is right; thank you very much. We appreciate the opportunity to make our views known here.

(Whereupon, at 10:20 a. m., the committee went to consideration of other business.)

(The following reports and letters were submitted for the record:)

TREASURY DEPARTMENT,
March 29, 1957.

HON. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D. C.

MY DEAR MR. CHAIRMAN: Reference is made to your request for the views of the Treasury Department on S. 1045, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

The bill would add a new title XIV to the Civil Aeronautics Act of 1938, the declared purpose of which would be to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation. Among other things, the bill would establish in the Civil Aeronautics Administration the Office of Civil Aviation Medicine, provide for grants-in-aid to public and private institutions and individuals for research projects, and authorize the appropration of $2,500,000 for a Civil Aeronautics Medical Research Laboratory.

While the functions proposed to be authorized by the bill are not of concern primarily to the Treasury Department, we are opposed to the initiation at this time of new Federal programs which have not been included in the President's budget, particularly where Federal construction is involved.

The Department has been advised by the Bureau of the Budget that there is no objection to the submission of this report to your committee.

Very truly yours,

FRED G. SCRIBNER, Jr.,
Secretary of the Treasury.

DEPARTMENT OF JUSTICE,
April 2, 1957.

HON. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D. C.

DEAR SENATOR: This is in response to your request for the views of the Department of Justice concerning the bill (S. 1045) to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

The bill would add a new title to the Civil Aeronautics Act of 1938, as amended (49 U. S. C. 401, et seq.) under which an Office of Civil Aviation Medicine would

be established in the Civil Aeronautics Administration, to be composed of a Civil Air Surgeon as the head of the office, regional flight surgeons, and the Civil Aeronautics Medical Research Laboratory. A sum not to exceed $2,500,000 would be authorized to be appropriated for the erection and equipment of buildings for use of the Civil Aeronautics Medical Research Laboratory on a site or sites to be acquired by purchase, condemnation, donation, or otherwise, by the General Services Administration. A 17-member board to be known as the Federal Advisory Council on Civil Aviation Medicine, including in its membership the Secretaries of the Air Force, of Navy, of Health, Education, and Welfare, and of Agriculture, and the Director of the Civil Aeronautics Medical Research Laboratory as ex officio members, are to act in an advisory capacity to the Civil Air Surgeon.

The purpose of the bill is stated to be to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation. The Civil Air Surgeon would be authorized to promulgate regulations establishing minimum standards of mental and physical fitness for civil airmen; establishing minimum human requirements in aircraft design; providing for medical examinations of civil airmen by medical designees or other medical examiners; and providing for issuance of medical certificates to civil airmen and for the amendment, suspension, or revocation of such certificates.

Whether the bill should be enacted involves a question of policy concerning which this Department prefers to make no recommendation.

The Bureau of the Budget has advised that there is no objection to the submission of this report.

Sincerely,

WILLIAM P. ROGERS,
Deputy Attorney General.

THE SECRETARY OF COMMERCE,
Washington, March 29, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D. C.

DEAR MR. CHAIRMAN: The committee has requested the comments of the Department of Commerce on S. 1045, a bill relating to civil aviation medicine, whose express purpose "is to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation * * *"

The bill, in order to carry out its objectives, proposes—

(*a*) To establish in the Civil Aeronautics Administration the Office of Civil Aviation Medicine, composed of—

(1) the Civil Air Surgeon, who shall act as head of the office,
(2) regional flight surgeons; and
(3) the Civil Aeronautics Medical Research Laboratory.

(*b*) To create a Federal Advisory Council on Civil Aviation Medicine consisting of 17 members, who shall serve without compensation, except on a fixed, per diem basis.

(*c*) To authorize to be appropriated a sum not to exceed $2,500,000 for the erection and equipment of adequate buildings for use of the Civil Aeronautics Medical Research Laboratory.

This bill would create an expanded medical division within the Civil Aeronautics Administration to be known as the Office of Civil Aviation Medicine. The present division now functions under the authority of the Civil Aeronautics Act of 1938, as amended. The 1938 act vested in the Civil Aeronautics Board the power and authority to promulgate regulations in the interest of safety, including regulations setting up standards of physical and mental fitness for airmen, as set forth in part 29 of the Civil Air Regulations. The administration of this part is one of the functions of the Civil Aeronautics Administration. That these regulations, up to this point, have adequately accomplished their objective is evidenced by the fact that an analysis of aircraft accidents shows only a negligible number that could be attributed to the pilot's physical deficiency or to any condition of mental instability.

The Department of Commerce, however, recognizes that past mental and physical standards are inadequate to meet future demands and that a more complete and precise knowledge of the human factors affected by flight, both physiological and psychological, is vitally related to safety in flight, especially as we move into the jet age. It would quite obviously be illogical and impractical

to develop and perfect aerodynamics without simultaneously conducting the necessary studies to determine the ability of the human being to withstand the altitudes, pressures, accelerations, vibrations, and other strains and stresses that are associated with flight at speeds and altitudes hitherto unexplored. Therefore, what this bill seeks to accomplish in the field of research and cooperative consultation is basically necessary. The question therefore is essentially one of deciding whether or not the enacting of this bill is timely and represents the most effective means of accomplishing the necessary research in the field of aeromedicine.

In arriving at a final position the Department feels that consideration should be given to existing research efforts and facilities. There are at the present time no less than 58 aeromedical research projects being conducted by military and civilian organizations throughout the country, some at no expense to the Government, some by the Military Establishment and others by private institutions with funds contributed in whole or in part by the Government. As an example of the latter, attention is directed to an important research project now being carried on by the Flight Safety Foundation, of New York, involving a study of aeromedical research needs, including physical standards for airmen, to which the Civil Aeronautics Administration contributed the sum of $100,000.

The Military Establishment is likewise conducting numerous aeromedical research projects. While many of these are directed at problems related to tactical flight, basically it is quite evident that the knowledge and information already acquired and that will be forthcoming in the future from military studies, involving high altitude, high speed, high operational capability flight and other aeromedical related subjects will, to a large degree be applicable to civilian as well as military flight problems.

There are presently being conducted certain areomedical research projects at Ohio State University. This is a continuing research activity conducted by a staff of the Civil Aeronautics Administration consisting of eight persons. The facilities employed in this work are also used by the university to provide special instruction to graduate medical students in the field of civil aviation medicine. The research data here developed are for the purpose of establishing a factual basis upon which official regulatory action may be taken in the interest of safety. As examples of the work being carried on at Ohio State University, the following are enumerated:

(*a*) Effects of sudden decompression on passengers.
(*b*) Emergency oxygen administration procedures.
(*c*) Emergency evacuation studies.
(*d*) Human factors of visibility as related to collision avoidance.
(*e*) Pilot fatigue.

The foregoing illustrates the progressive efforts being made in the field of civil aviation medicine, but it is recognized that much work remains to be done in these and other fields where need for research is necessary because of the advent of jet aircraft. The studies of the Flight Safety Foundation, referred to above, are designed to determine civil aviation's requirements for aviation medical research and standards. Determinations based on these studies should be forthcoming in the near future, but in the meantime funds for research of critical aeromedical problems we believe can be most productively employed in carrying on the work at Ohio State University and elsewhere.

The Department initiated meetings with the American Medical Association early this year for the purpose of obtaining advice from the United States medical profession as to the improvement of the civil areomedical situation. Following a joint meeting of a specially selected ad hoc group of eminent physicians in this field, during which the aviation medical problems were explored, and the above projects taken into account, the American Medical Association has taken under study recommendations leading to an increase of medical assistance and effort in dealing with these problems.

The recommendations are generally in connection with the need for a current and comprehensive medical and psychological study of flight physical standards, as well as for additional medical assistance in the field of guidance for research and planning programs, arriving at physical standards for the future, and in providing expert advice on controversial cases involving aeromedical problems.

An official report on this matter is expected from the American Medical Association in the near future. Following receipt of this report, the Department will take such action as is deemed appropriate.

The Department of Commerce is of the opinion that there now exists sufficient authority in law under the provisions of the Civil Aeronautics Act of 1938, both to conduct and finance projects such as those now being carried on at Ohio State University and elsewhere.

Apart from the questions of the needs of research and study in the field of aeromedicine, which involve primarily problems of method rather than objective, there is one provision of this bill, dealing with the transfer of regulatory power, which the Department feels is basically objectionable. Section 1405 of this bill delegates to the civil air surgeon the authority to promulgate regulations:

"(1) Establishing minimum standards of mental and physical fitness for civil airmen;

"(2) Establishing minimum human requirements in aircraft design;

"(3) Providing for medical examinations of civil airmen by medical designees or other medical examiners; and

"(4) Providing for the issuance of medical certificates to civil airmen and for the amendment, suspension, or revocation of such certificates."

and a similar provision of section 1406 provides that—

"The civil air surgeon shall promulgate such regulations as he deems necessary—

"(1) for the inspection of aircraft and aircraft components and appliances designed for use in air transportation in order to meet the human requirements in aircraft design and operation."

While this bill does not specifically so provide, it is the opinion of this Department that its enactment would divest the Civil Aeronautics Board of its present rulemaking authority in this area and transfer this entire function to the civil air surgeon. Considering that the Board under the provisions of the Civil Aeronautics Act of 1938, as amended, has been given broad regulatory power by the Congress over virtually all phases of civil aviation, including regulations establishing airmen qualifications, it would seem to us incongruous to separate the Board's regulatory powers with respect to medical requirements from the main body of other and equally important regulatory powers and place them under the jurisdiction of a single administrative officer, i. e., the civil air surgeon, who would appear to have the power, under the language of section 1405 of the bill, not only arbitrarily to establish "minimum standards of mental and physical fitness for civil airmen" but also have the arbitrary power over "the issuance of medical certificates to civil airmen and for the amendment, suspension or revocation of such certificates."

In summary, the Department of Commerce recognizes the importance of the studies and research contemplated by this bill but is of the opinion that already existing and active aeromedical research facilities, projects and studies should be carefully evaluated before determining what legislation, if any, is needed. For these reasons, the Department of Commerce does not favor enactment of this bill.

We have been advised by the Bureau of the Budget that it would interpose no objection to the submission of this letter to your committee.

Sincerely yours,

SINCLAIR WEEKS,
Secretary of Commerce.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
April 3, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Senate Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D. C.

DEAR MR. CHAIRMAN: This letter is in response to your request of February 12, 1957, for a report on S. 1045, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

This bill would define and broaden the medical responsibility of the Administrator of Civil Aeronautics to include the development, promulgation, and administration of rules and regulations pertaining to medical matters in air commerce. It would establish an Office of Civil Aviation Medicine within the framework of the Civil Aeronautics Administration, create a Civil Aeronautics Medical Research Laboratory, and authorize research grants for the development of technical medical information relating to civil aeronautics safety.

This Department does not have any direct knowledge of the present and expected problems of air commerce to which the creation of an Office of Civil Aviation Medicine must be related. Thus, we have no opinions on those portions of this bill concerned with the establishment and functioning of such an office.

There are, however, two matters on which we would like to comment. First, based on our general experience in the direct conduct of medical research and in supporting such research through grants, we believe that there is a need for further specialized research in this field. Overall knowledge of the interaction of the human mind and body with complex machines moving at high rates of speed in intricate and rapidly changing circumstances is limited. This is certainly so with respect to the problems of motor-vehicle traffic and automobile accidents—an older field in which we have more experience. Basic knowledge of the medical aspects of air commerce and safety can therefore be assumed to be less nearly adequate. While the medical research now in progress in governmental and other laboratories will make valuable contributions to the body of knowledge in this area, and we are therefore pleased to note the provisions in the bill for interdepartmental work and collaboration, a specialized center of research in this field seems desirable for the more effective conduct of the direct operating functions.

Second, the new section 1410 (b) (proposed to be added to the Civil Aeronautics Act) contains a saving clause to preserve the quarantine and inspectional authority of the Surgeon General of the Public Health Service. This is done by reference to specific sections of the Public Health Service Act, but apparently by inadvertence some of the pertinent sections have been omitted. It is therefore recommended that the proposed section 1410 (b) be amended to provide that nothing contained in the act shall affect any authority of the Surgeon General of the Public Health Service under the Public Health Service Act, or any other provision of law.

Subject to the above comment and suggestion, we defer to the views of the Secretary of Commerce on the merits of the bill.

The Bureau of the Budget advises that it perceives no objection to the submission of this report to your committee.

Sincerely yours,

JOHN A. PERKINS, *Acting Secretary.*

DEPARTMENT OF THE AIR FORCE,
Washington, April 1, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate.

DEAR MR. CHAIRMAN: Reference is made to your request for the comments of the Department of Defense on S. 1045, 85th Congress, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil-aviation medicine. The Secretary of Defense has delegated to this Department the responsibility for expressing the views of the Department of Defense on this matter.

The purpose of this proposed legislation is to establish in the Civil Aeronautics Administration the Office of Civil Aviation Medicine composed of (1) a Civil Air Surgeon; (2) regional flight surgeons; and (3) a Civil Aeronautics Medical Research Laboratory. The Civil Air Surgeon would be authorized to promulgate (1) regulations concerning physical and mental standards and requirements for civil airmen; and (2) regulations concerning inspections of aircraft and components designed for use in air transportation, to meet human requirements in aircraft design and operation. An authorization for the appropriation of a sum not to exceed $2,500,000 is included for the establishment of a Civil Aeronautics Medical Research Laboratory. A 17-member Federal Advisory Council on Civil Aviation Medicine would be established, which would include representation from agencies of the Department of Defense.

The field of aviation medicine occupies an important position in the research activities of the Department of Defense. The broad purpose of S. 1045, to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation, coincides with the objectives of the Department of Defense in the field of military aviation. Cooperation between the Civil Aeronautics Administration and other appropriate public and private agen-

cies concerned with aeromedical matters should prove beneficial to both civil and military aviation.

In order to clarify the definition of "civil aviation medicine," it is recommended that the word "civil" be inserted after the words "requirements in," in line 11, page 2; line 5, page 5; line 19, page 5; and line 13, page 6, of S. 1045.

The new section 1402 (c) proposed by section 2 of the bill defines "Council" as the Council which would be established by proposed new "section 140" (line 17, page 2, of S. 1045). The reference to "section 1409" should be revised to read "section 1413."

The Department of the Army has considerable experience in the use of light organic aircraft of both fixed and rotary-wing types, and could advise the Council on medical problems relating to such flying. Therefore, it is recommended that the word "seventeen" in line 10, page 9 of the bill, be changed to "eighteen", and the words "the Secretary of the Amy," be inserted after the word "Navy," in line 13, page 9 of S. 1045.

Subject to the foregoing amendments the Department of Defense has no objection to S. 1045. However, this Department defers to the opinions of those agencies having the statutory responsibility in this area on the question of whether the stated purpose of the bill could be best accomplished in the manner set out therein.

This report has been coordinated within the Department of Defense in accordance with procedures established by the Secretary of Defense.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

DUDLEY C. SHARP,
Assistant Secretary of the Air Force.

GENERAL SERVICES ADMINISTRATION,
Washington, D. C., April 1, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington, D. C.

DEAR MR. CHAIRMAN: Further reference is made to your letter of February 12, 1957, which requested the comments of the General Services Administration on S. 1045, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

S. 1045 provides for the creation of an Office of Civil Aviation Medicine within the framework of the Civil Aeronautics Administration. This bill requires the General Services Administration to acquire a site or sites, prepare plans, specifications, contracts, and supervise the construction of adequate buildings for the use of the Civil Aeronautics Medical Research Laboratory.

The functions of this agency are not concerned with the establishment and organization of an Office of Civil Aviation Medicine in the Civil Aeronautics Administration. Under existing statutory authority, GSA could perform the duties set out in section 1416 of this bill relating to acquisition of sites and equipment, preparation of drawings and specifications, and supervision of construction to supply adequate buildings and facilities to be used in a laboratory as set out in the bill.

Therefore, it is not considered appropriate for GSA to comment upon S. 1045.

The Bureau of the Budget has advised that there is no objection to the submission of this report to your committee.

Sincerely yours,

FRANKLIN G. FLOETE, *Administrator.*

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, March 15, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate.

DEAR MR. CHAIRMAN: Your letter of February 12, 1957, acknowledged February 13, requests any comments we may desire to offer concerning S. 1045.

The purpose of the proposed legislation—namely, the improvement of safety in air commerce through the development and application of sound medical knowledge in civil aviation—appears a laudable one. However, we have neither factual information nor firsthand knowledge concerning the extent of the need for such legislation. In view thereof, and since we do not know whether legislation along the lines of S. 1045 would be the most effective means of accomplishing the purpose of the bill, we do not feel warranted in making any recommendation concerning its merits.

However, we do wish to point out several features of the bill which warrant your committee's consideration:

We assume that the Administrator of the Civil Aeronautics Administration will appoint the Civil Air Surgeon and the Deputy Civil Air Surgeon of the Office of Civil Aviation Medicine, but we do not feel that the bill is entirely clear as to whether it is contemplated that the Administrator shall make all other appointments—with the exception of consultants appointed under section 1414 and members of the Federal Advisory Council appointed under section 1413 (a)—which will be required by reason of its enactment. We consider that this point should be clarified in the bill. We also are of the view that consideration should be given to including a specific provision in the bill establishing the position of the Director, Civil Aeronautics Medical Research Laboratory, including his grade and salary.

The provison in section 1413 (a), that no appointed member of the Federal Advisory Council on Civil Aviation Medicine shall be eligible for reappointment until a year has elapsed since the end of his preceding term, is apparently intended to prevent continuous reappointments to incumbents. If so, it should be noted that in emergencies necessitating new appointments prior to expiration of an incumbent's term a desirable reappointment of a former member to fill such vacancy might be prohibited by the present provision. Since vacancies in membership normally would not occur until 1 year after the date on which a former member's term expires, your committee may wish to consider the advisability of amending the present provision to provide that a member may not be reappointed to succeed himself.

It also would seem desirable to fix the allowable travel expenses and subsistence, payable under section 1415 of the bill, to amounts prescribed in the Travel Expense Act of 1949, as amended, and the Standardized Government Travel Regulations. This would provide a yardstick for determining the propriety of payments under this section.

Your attention is invited to the figures "1409" appearing in line 17, page 2, which should properly read "1413", and to the erroneous inclusion of the word "to" in line 4, page 15.

Sincerely yours,

FRANK H. WEITZEL,
Assistant Comptroller General of the United States.

CIVIL AERONAUTICS BOARD,
Washington, March 29, 1957.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
United States Senate, Washington 25, D. C.

DEAR SENATOR MAGNUSON: This is in further reply to your letter of February 12, 1957, acknowledged February 15, 1957, asking the Board for its comments on S. 1045, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine.

The Board's views in regard to the proposed amendment to the Civil Aeronautics Act are set forth in a statement to be submitted to the committee on behalf of the Board by Mr. Oscar Bakke, Director of the Bureau of Safety, at the hearing scheduled for April 1, 1957. Copies of the statement are transmitted herewith.

Sincerely yours,

JAMES R. DURFEE, *Chairman.*

AMERICAN MEDICAL ASSOCIATION,
Washington, D. C., April 2, 1957.

Senator WARREN G. MAGNUSON,
Chairman, Senate Committee on Interstate and Foreign Commerce,
United States Capitol, Washington 25, D. C.

DEAR SENATOR MAGNUSON: We regret that we were unable to have a witness testify today on S. 1045, which would establish in the Civil Aeronautics Administration an Office of Civil Aviation Medicine and create a medical research institute thereunder.

In February of this year our association, at the request of the Under Secretary of the Department of Commerce, Louis Rothschild, appointed an ad hoc committee of physicians with outstanding records in the field of aeronautical medicine to make a study and recommendations in the area needed to improve the organization and functions of civil aviation medicine.

This committee met with Deputy Civil Aeronautics Administrator William B. Davis and some of his technical people to define the problem more accurately. At present our association is reviewing material in this field and until its completion is not in a position to support, oppose, or recommend modifications in the bill being considered by your committee. For that reason it is hoped you will find it appropriate to defer action for the present so that we can be of service in advising your committee of the results of the study and the recommendations resulting therefrom.

Attached is a list of the special American Medical Association committee.

Sincerely yours,

THOMAS H. ALPHIN, M. D.

MEMBERS OF THE SPECIAL COMMITTEE ON CIVILIAN AVIATION MEDICAL PROBLEMS

Dr. Jan Tillisch, chairman, Mayo Clinic, Rochester, Minn.
Dr. L. O. Simenstad, Osceola, Wis.
Dr. G. J. Didera, medical director of the United Airlines, Chicago, Ill.
Dr. Ludwig G. Lederer, medical director of Capital Airlines, Washington, D. C.; chairman of Air Transport Association medical committee
Dr. William Ashe, professor of preventive medicine, Ohio State University
Dr. Victor A. Byrnes (brigadier general, USAF (MC)), Director of Professional Services, Office of Surgeon General, United States Air Force
Dr. Langdon Newman (captain, (MC) USN), Director of Aviation Medicine, Bureau of Medicine and Surgery, United States Navy
Dr. William J. Kennard (brigadier general, USAF (MC) (retired)), assistant director, AMA Washington office, Washington, D. C.
Dr. Thomas H. Alphin, director, AMA Washington office, Washington, D. C.

WHITE SULPHUR SPRINGS, W. VA., *April 4, 1957.*

Hon. A. S. MIKE MONRONEY,
Chairman, Subcommittee on Aviation,
Committee on Interstate and Foreign Commerce,
Capitol Building, Washington, D. C.:

Regret inability to testify before your committee because of previous commitment to attend medical conference in South. I endorse enthusiastically bill S. 1045 as a major contribution to the future of civilian aviation medicine and safety.

First, because the program outlined in the bill will bring many needed improvements in the quality and scope of civilian aeromedical preventive medicine.

Second, the problems differ from those in the military services and should have specialized consideration and study.

Third, the human factors involved in the design and operation of jet transports and private aircraft require advance analysis and experimentation as proposed in the research facilities section of the bill. Proximity of such a laboratory to a major civilian air center is imperative with access to air crews, passengers, and educational institutions.

Fourth, there is urgent need for well-trained personnel in aviation medicine and in human engineering. Fellowships and grants-in-aid are a basic necessity to accomplish these objectives.

Finally, this bill, S. 1045, offers great encouragement and promise to those of us who have devoted many years of research, study, and hard work to the advancement of civil aviation.

Will be pleased to meet with your committee or provide further information if you so desire.

Prof. ROSS A. MCFARLAND,
Harvard School of Public Health.

BALTIMORE, MD.

Hon. JOHN MARSHALL BUTLER,
Interstate and Foreign Commerce Committee,
Senate Office Building, Washington, D. C.:

DEAR SENATOR BUTLER: On behalf of the members of the Maryland Optometric Association we are asking you to give favorable consideration optometry amendments to S. 1045.

Optometry has presented numerous amendments, but they involve only the principle that the responsibility for certifying to the physical fitness of aviation personnel and the formation of regulations pertaining thereto should not be the sole responsibility of medicine but that the services of optometry should be made available as well.

Optometry's sole interest is in vision and the importance of vision in air transport cannot be overemphasized.

We ask you to include optometric amendments in the bill when it is reported out of committee.

Respectfully yours,

B. A. SALTYSIAK, O. D.,
Secretary of the Maryland Optometry Association.

MAYO CLINIC,
Rochester, Minn., March 29, 1957.

Senator WARREN G. MAGNUSON,
Office of the Senate, Washington, D. C.

DEAR SENATOR MAGNUSON: I am sending you my comments on S. 1045, a bill to amend the Civil Aeronautics Act of 1938, as amended, by adding thereto new provisions relating to civil aviation medicine. This is a bill designed to improve safety in air commerce through the development and application of sound medical knowledge in civil aviation.

This would be accomplished by the provisions of the bill which would:

1. Make aviation medicine a major program responsibility of the Civil Aeronautics Administration of this department;
2. Transfer from the Civil Aeronautics Board to this department the authority to issue air safety regulations in this field;
3. Explicitly assign program responsibility for research, investigations, education, and training in civil aviation medicine;
4. Authorize an appropriation for the erection and equipment of suitable and adequate research buildings and facilities;
5. Provide for issuing grants-in-aid for aviation medicine, and acceptance of unconditional gifts in support of medical program equipment;
6. Direct the establishment of a Federal advisory council on civil aviation medicine;
7. Authorize the establishment of special consultants to assist and advise in the operation of the medical program.

We favor all of these major objectives.

It is believed at the present time with the growth of commercial aviation, aviation medicine has become a major governmental program responsibility. With the advent of the high-performance aircraft with turbojet and jet power, it makes it mandatory that the air crew be not only selected but maintained at the highest point of physical efficiency. The importance of aviation medicine in our national medical structure has been recognized by the American Medical Association designating aviation medicine as a specialty.

It is believed that the specific principles involved in the specification of physical standards for civil airmen and the evaluation of questionable or unacceptable medical conditions properly belong and must be exercised by physicians

qualified by virtue of their competence in aviation medicine. Because of the increasing operational tasks of airmen, emphasis must be placed upon insuring adequate levels of pilots' physical fitness, mental judgment, and capability to perform under normal and emergency conditions. The highly technical nature of the tasks involved requires that the profession determinations should be under constant supervision and the development of those who have the necessary professional qualifications and experience to maintain standards which are suited to current operational demands, and which apply, with a minimum of delay, to advances in the medical sciences.

It is believed that there must be a factual basis upon which to formulate safety regulations, especially physical standards. For this, it is necessary that there be established medical research and investigation. There should be detailed airmen task analysis, study of passenger handling procedures in emergencies, survival in various temperature zones, airmen fatigue, and proper medical investigations of accidents with incorporated pathological studies, medical diagnosis, and prognosis.

To improve the medical examinations for our airmen and to forward research in the various fields of aviation medicine, there must be encouragement of basic courses for the undergraduate, residency courses for the graduate, and postgraduate training and education for the physician already in practice. These requirements can be taken care of only by an adequate Federal civil aviation medicine research facility.

It is further believed that there should be established an advisory medical council for civil aviation. This would make available men of qualified medical judgment for review of aeronautical developments and their bearing on physical standards, review and evaluation of interim and cumulative experience in application of the standards, application of newly developed medical knowledge, and advice on policy and on designee qualifications. It would also insure that the necessary and appropriate emphasis be given to each of the various fields of medicine which are important to airmen physical fitness.

In summary, it is my opinion that there is a need for a reevaluation of civil aviation medical establishment and in general, I believe that S. 1045 will not only correct errors in practice and policy now present but will be of great aid in solving this increasingly important medical and national problem.

Sincerely yours,

JAN H. TILLISCH, M. D.

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